EDUCATIONAL and PSYCHOLOGICAL MEASUREMENT

VOLUME FOUR, NUMBER THREE, AUTUMN

A Technique for Scale Analysis. WARD H. GOODENOUGH, SGT., A. U. S. 179

A Study of the Use of Mechanical Aptitude Tests in the Selection of Trainees for Mechanical Occupations. J. W. MCDANIEL and WM. A. REYNOLDS 191

A Validating Study of the Oberlin Vocational Interest Inquiry. L. D. HARSTON 199

Guidance Survey of Student Problems. ELIZABETH GORDON ANDREWS 209

Interpretation of the Kuder Preference Record for College Students of Home Economics. RUTH T. LEHMAN 217

The Use of Standardized Reading Tests in Teachers Colleges. ALFRED M. EWING 225

Measurement in the Continuous Selection and Counseling of Students in a College of Physical Education and Social Work. J. E. TODD 233

Guidance Through Self-Appraisal. FORREST E. HEWITT 245

Measurement Abstracts 251

News Notes 257

Copyright, 1944, by
SCIENCE RESEARCH ASSOCIATES

STATEMENT OF THE OWNERSHIP, MANAGEMENT, CIRCULATION, ETC., REQUIRED BY THE ACTS OF CONGRESS OF AUGUST 24, 1912, AND MARCH 3, 1933, of EDUCATIONAL AND PSYCHOLOGICAL MEASUREMENT, published quarterly at Chicago, Illinois, for October 1, 1944. STATE OF Illinois, COUNTY OF Cook.

Before me, a Notary Public in and for the State and county aforesaid, personally appeared Walter A. Symons, who, having been duly sworn according to law, deposes and says that he is the Business Manager of the EDUCATIONAL AND PSYCHOLOGICAL MEASUREMENT, and that the following is, to the best of his knowledge and belief, a true statement of the ownership, management (and if a daily paper, the circulation), etc., of the aforesaid publication for the date shown in the above caption, required by the Act of August 24, 1912, as amended by the Act of March 3, 1933, embodied in section 537, Postal Laws and Regulations, printed on the reverse of this form, to wit:

1. That the names and addresses of the publisher, editor, managing editor, and business managers are: Publisher, SCIENCE RESEARCH ASSOCIATES, 228 S. Wabash Ave., Chicago 4, Ill. Editor, G. Frederic Kuder, 228 S. Wabash Ave., Chicago 4, Ill. Managing Editor, John R. Yale, 228 S. Wabash Ave., Chicago 4, Ill. Business Manager, Walter A. Symons, 228 S. Wabash Ave., Chicago 4, Ill.

2. That the owner is: (If owned by a corporation, its name and address must be stated and also immediately thereunder the names and addresses of stockholders owning or holding one per cent or more of total amount of stock. If not owned by a corporation, the names and addresses of the individual owners must be given. If owned by a firm, company, or other unincorporated concern, its name and address, as well as those of each individual member, must be given.) Hon. Ralph A. Bard, Navy Bldg., Washington, D. C. R. W. Glasner, 6499 W. 65th St., Chicago, Ill. Alfred E. Hamill, 208 S. LaSalle St., Chicago, Ill. Robert C. McNamara, 623 S. Wabash Ave., Chicago, Ill. Charles S. Boyd, Appleton Coated Paper Co., Appleton, Wis. John I. Shaw, 135 S. LaSalle St., Chicago, Ill. Major Lyle M. Spencer, 3744 Holmes Lane, Parkfairfax, Alexandria, Va. Dorothy Jacobs Spencer, 3744 Holmes Lane, Parkfairfax, Alexandria, Va. Dorothy Bard, c/o Roy E. Bard, 134 S. LaSalle St., Chicago, Ill. George M. Bard, II, c/o Hon. Ralph A. Bard, Navy Bldg., Washington, D. C. Roy E. Bard, 134 S. LaSalle St., Chicago, Ill. Janet Bard, c/o Hon. Ralph A. Bard, Navy Bldg., Washington, D. C. Robert K. Burns, 1700 Prairie Ave., Chicago 16, Ill. Grace M. Wagner, c/o Richard Wagner, 135 S. LaSalle St., Chicago, Ill. W. C. Winkel, c/o Modine Mfg. Co., Racine, Wis. Lt. Col. Frank W. Renwick, Ordnance Dept., 1st National Bank Bldg., Chicago, Ill. John R. Yale, 228 S. Wabash Ave., Chicago 4, Ill. Florence Reed, c/o Guy E. Reed, Prairie View, Ill. Sgt. Louis Eisman, 1249 Hazard St., Los Angeles, Calif. Clarice W. Hamill, c/o Alfred E. Hamill, 208 S. LaSalle St., Chicago, Ill.

3. That the known bondholders, mortgagees, and other security holders owning or holding 1 per cent or more of total amount of bonds, mortgages, or other securities are: (If there are none, so state.) None.

4. That the two paragraphs next above, giving the names of the owners, stockholders, and security holders, if any, contain not only the list of stockholders and security holders as they appear upon the books of the company but also, in cases where the stockholder or security holder appears upon the books of the company as trustee or in any other fiduciary relation, the name of the person or corporation for whom such trustee is acting, is given; also that the said two paragraphs contain statements embracing affiant's full knowledge and belief as to the circumstances and conditions under which stockholders and security holders who do not appear upon the books of the company as trustees, hold stock and securities in a capacity other than that of a bona fide owner; and this affiant has no reason to believe that any other person, association, or corporation has any interest direct or indirect in the said stock, bonds, or other securities than as so stated by him.

5. That the average number of copies of each issue of this publication sold or distributed, through the mails or otherwise, to paid subscribers during the twelve months preceding the date shown above is: not a daily. (This information is required from daily publications only.)

Signed: Walter A. Symons, Business Manager. Sworn to and subscribed before me this 22d day of August, 1944.—Dorotha Moehle.

(Seal) (My commission expires June 12, 1946.)

PRINTED IN THE UNITED STATES OF AMERICA
THE SCIENCE PRESS PRINTING COMPANY
LANCASTER, PENNSYLVANIA

A TECHNIQUE FOR SCALE ANALYSIS

WARD H. GOODENOUGH, SGT., A.U.S.

IN the past two years a considerable amount of time has been devoted to scale analysis by the Research Branch, Information and Education Division (formerly Morale Services Division) of the War Department, where the use of scales has been important in attitude and opinion research.

The aim of this paper is to make available to others working with scales one of the techniques for scale analysis developed in the Research Branch. The theory involved in this type of analysis has been outlined elsewhere[1] and is not directly dealt with here.

Four specific techniques have been employed by the Research Branch. All produce essentially the same results, differing only in the mechanics involved. All have limitations either of a rigorous or practical nature.

The first of these is the *least squares* method (Guttman, Louis, "The Quantification of a Class of Attributes." *The Prediction of Personal Adjustment,* Social Science Research Council Bulletin No. 48, 1941). This method is too laborious to be readily usable when one is dealing with more than a few items and categories.

A second method, the one generally used by the Research Branch, is to plot data on a *Scalogram Board,* invented for the purpose by Dr. Louis Guttman. This is an easily used system, especially if the sample is confined to 100 cases or less, which is usually adequate; but it is less rigorous, since manipulations of the data are based largely on inspection. The board has the further difficulty that it is somewhat expensive to construct.

[1] Guttman, Louis. "A Basis for Scaling Qualitative Data." *American Sociological Review,* IX (1944), 139–150.

A third method, the *trial-scoring and graphic technique,* has been used in the work of the Department of Sociology and Anthropology at Cornell University as well as in the Research Branch. It has the advantage that it does not require a board, but is less flexible.

Finally, the *tabulation technique,* the one to be outlined here, was devised to enable scale analysis without a board, at the same time preserving its flexibility. It is also more rigorous than the Scalogram Board method and can be used with any size sample. Its limitation is that, for practical use, the relative rank order of categories for each item must be assumed in advance, which is not necessary with either the least squares or Scalogram Board technique. The technique is easy to learn and as a process reveals clearly what is operationally involved in scale analysis.

According to Guttman's definition,[2] the multivariate distribution of a set of qualitative items forms a scale for a population if the following conditions are satisfied:

(a) the items have sameness of content (that is, they form a universe of content);

(b) each item is a simple function of scores derived from the distribution.

Condition (a) is mainly determined by the nature of the problem an investigator is interested in. For example, suppose we are interested in students' expressions of adjustment to life at a particular college. For this purpose we might ask such questions as:

(1) How satisfied are you with college life?

(2) Do you think that what you are learning is worth while or not?

(3) What sort of a time are you having at college?

We ask these questions because they are a sample from the universe of content which is the object of our investigation. Having defined the universe (in this case, adjustment to college life) and having collected a sample of data, we want to know whether or not the responses we have obtained behave

[2] *Ibid.*

as simple functions of a single variable. If so, this will be evidence that the universe is a scale for the population, and we can derive meaningful relative adjustment scores based on the responses to the items.

This brings us to condition (b) of a scale. Can we show that each item is or is not a *simple* function of scores derived from the distribution of the items? The procedures to be discussed here refer mainly to this problem, the practical one of outlining a specific technique whereby it is possible with relative ease and precision to determine whether or not a set of items satisfy the formal condition (b) of a scale.

The question might arise as to why this is a problem at all. If a set of items formed a perfect scale, this would be easily established by any of the several techniques. The problem arises *when the scale-relationship of a set of items is obscured by the items' categories.* This requires the *combining of categories,* which manipulation creates the main technical problem, as will be seen in the ensuing discussion.

For purposes of illustration we shall concern ourselves with the three hypothetical questions on student adjustment to college life. We shall assume that each question has three categories, which we have assigned them on the questionnaire.

(1) How satisfied are you with college life?
   (a) Very satisfied
   (b) Neither satisfied nor dissatisfied
   (c) Very dissatisfied

(2) Do you think that what you are learning is worth while or not?
   (a) It is worth while
   (b) Undecided
   (c) It is not worth while

(3) What sort of a time are you having at college?
   (a) I am having a good time
   (b) I am having a fair time
   (c) I am having a miserable time

First, then, we must see what the conditions are under which each item can be said to be a simple function of scores derived from the distribution of the items. To do this, suppose the responses to our three questions gave us the following marginal frequencies:

		Category			
		a.	*b.*	*c.*	*Total*
Item	1.	25	20	55	100
	2.	20	60	20	100
	3.	40	30	30	100

We can express these marginal frequencies in bar chart form (Fig. 1).

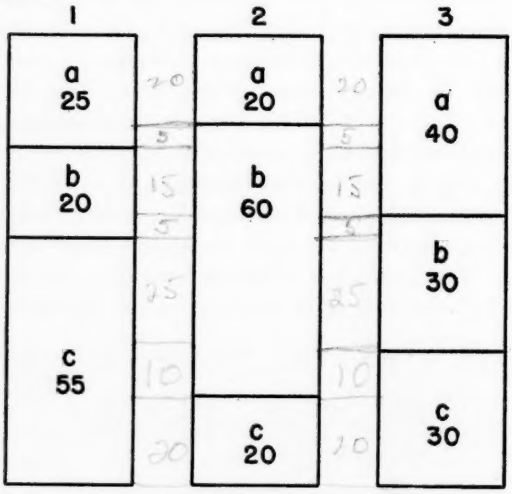

Figure 1

For the items to form a scale, that is, to be simple functions of scores derived from the items, all those respondents who make the positive response (a) to item 2 must also make positive responses to items 1 and 3, as Guttman has shown (*ibid*). This group of respondents would constitute a *scale type*. In like manner, the other scale types can be read from the bar chart (*provided*, the items form a scale) simply by connecting the bars with dash lines (Fig. 2).

It is clear then, that, given the marginal frequencies to a set of items and the relative position of the categories within each item, it is possible to ascertain which response combinations, from among all those *possible* for the items, constitute the ideal scale types for those marginal frequencies.[3] But we still do not know whether or not the items actually scale. We are faced with the problem of determining how close to the ideal

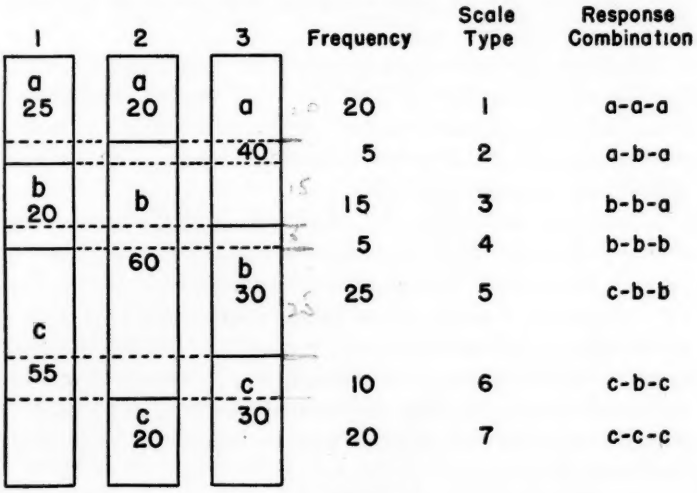

Figure 2

the obtained response combinations and their frequencies actually come.

If a tally of the response combinations obtained showed all to coincide with the ideal scale type combinations and their frequencies as determined from the marginal frequencies, the responses would form a perfect scale and there would be no further problem of procedure. In practice, however, such perfect conformity is almost never encountered. The response

[3] It is possible to determine the maximum number of scale types though not the combinations of responses which constitute them by using Guttman's formula: Maximum number of scale types equals sum of categories in all items plus one minus number of items ("The Desire of Enlisted Men for Post-War Full-Time Schooling: An Example of a Scale." Mimeographed Paper, Research Branch, Morale Services Division, ASF, 1943).

patterns obtained always vary to a greater or lesser degree from the ideal scale established for the marginal frequencies.

The problem, therefore, is to determine to what extent the response patterns obtained approximate the ideal scale; to what extent the response patterns obtained may deviate from the ideal scale and still permit of analysis in scale terms; and what the procedural implications are when the response patterns deviate beyond such an established point of tolerance from the initial ideal scale.

Guttman has set the point of tolerance for deviation at 15%. In other words, at least 85% of the total number of responses must fall within the scale pattern, so that it is possible to reproduce at least 85% correctly all the responses of all the respondents from the scale scores.

If there is more than 15% deviation from the initial ideal scale, we have evidence that there is more than one factor or variable involved. This allows us two inferences. One is that the extraneous factors are of minor importance and mainly affect only the categories, in which case they can be partialled out by combining categories. The other inference is that there are major factors affecting the items themselves, in which case category combination will not partial them out and no scale can be established.

To illustrate what is involved where the first inference obtains, let us suppose that a count of all the possible response combinations for our three items on adjustment to college life showed the following results. (When large samples are involved, this can easily be done on the counting sorter machine or with tabulating equipment if the data are put up on I.B.M. punch cards. Lacking such equipment, one may conveniently determine the nature of the scale relationship by working with a sub-sample of 100 respondents.)

Here we have deviation from the ideal scale well beyond the 15% point of tolerance. Our problem now is to examine the nature of the deviation.

A glance at the six response combinations which deviate from the ideal scale types shows that four of them have one

Item	Ideal Scale Type Combinations 1.	2.	3.	Ideal Frequency	Obtained Frequency	Item	Other Combinations Obtained 1.	2.	3.	Obtained Frequency
	a	a	a	20	15		a	a	b	5
	a	b	a	5	5		c	b	a	5
	b	b	a	15	5		b	c	a	5
	b	b	b	5	5		b	c	b	5
	c	b	b	25	10		c	c	a	5
	c	b	c	10	30		c	c	b	5
	c	c	c	20	0					
	Total			100	70					30

thing in common: the response (c) to item 2. If we consider categories (c) and (b) on item 2 to be equivalent responses from the standpoint of the scale relationship of item 2 to the other items, then 15 of the deviant responses coincide with scale types: b–c–a is equivalent to the scale type b–b–a, b–c–b to b–b–b, and c–c–b to c–b–b. Furthermore, the scale types c–c–c and c–b–c are equivalent and the sum of their obtained frequencies is equal to the sum of their ideal frequencies.

Therefore, in order to reduce deviation from the ideal types and frequencies to less than 15%, it is possible to combine categories of any item. Each combination eliminates a discriminating scale type, however, and a minimum of combination is therefore desirable.[4] It is to be noted that since a combination involves the assumption that two categories are equivalent in the scale, it is ordinarily possible to combine only categories which are adjacent to each other in the category hierarchy of an item. In our present example we can combine positive (a) with neutral (b) or neutral (b) with negative (c), but not positive (a) with negative (c) without including neutral (b), which would eliminate the item from the scale as having no discriminatory value.

To facilitate category combination it is generally desirable to set up a distribution table such as the one below (Fig. 3). For purposes of illustration we shall show in the table all the possible combinations of response, which ones are the ideal scale types, and where the obtained frequencies fall. Using our three items on adjustment to college life, we get the following:

[4] In accordance with Guttman's formula in footnote 3.

a			b			c			Item 1.
a	b	c	a	b	c	a	b	c	Item 2.
a b c	a b c	a b c	a b c	a b c	a b c	a b c	a b c	a b c	Item 3.
20	5		15 5			25 10		20	Ideal Freq.
15 5	5		5 5	5 5		5 10 30	5 5		Obtained Freq.
1	2		3 4			5 6		7	Scale Type

Figure 3

When we combine categories (b) and (c) on item 2, as we have already ascertained to be desirable, our table looks as follows (Fig. 4):

a			b			c			Item 1.
a		b&c	a		b&c	a		b&c	Item 2.
a	b	c	a	b	c	a	b	c	Item 3.
20		5	15	5			25	30	Ideal Freq.
15	5	5	10	10		10	15	30	Obtained Freq.
1		2	3	4			5	6 9 7	Scale Type

Figure 4

In order to reduce the deviant frequency 10 for the response combination c–b&c–a (Fig. 4) we can combine either (b) and (c) on item 1 (in which case b–b&c–a coincides with c–b&c–a) or (a) and (b) on item 3. The latter will also reduce the deviation involved in the combination a–a–b. Thus, by the fewest possible combinations of category, we obtain the maximum possible reduction in deviation and emerge with the following table (Fig. 5):

a				b				c				Item 1.
a		b&c		a		b&c		a		b&c		Item 2.
a&b	c	a&b	c	a&b	c	a&b	c	a&b	c	a&b	c	Item 3.
20		5				20				25	30	Ideal Freq.
20		5				20				25	30	Obtained Freq.
1		2				3&4				5	6&7	Scale Type

Figure 5

The scale that emerges from the data actually obtained for our three items can now be presented in bar chart form (Fig. 6).

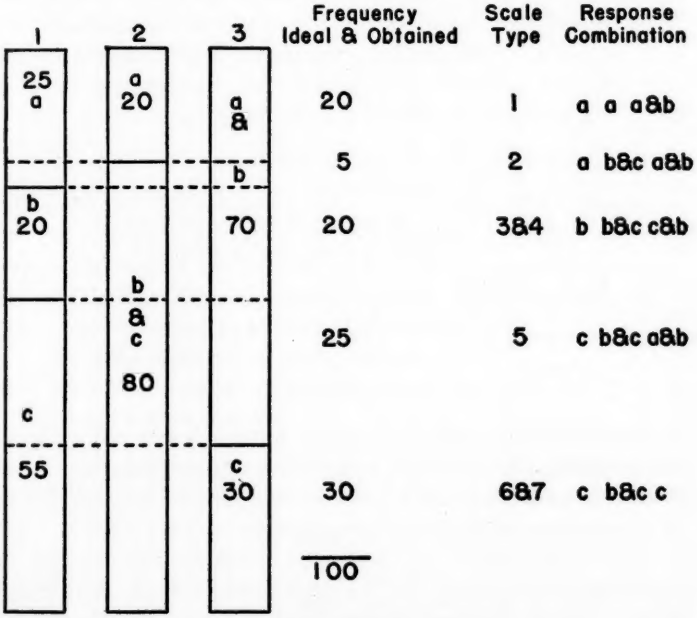

Figure 6

We can now say that all those respondents who are included in response (a) of item 2 are also included in (a) of item 1 and

(a&b) of item 3, and so on down the scale. It is possible to reproduce the responses of any respondent from whatever set of scores one may wish to use to designate the five scale types.

In other words, we can now discriminate five degrees of what we are calling adjustment to college life on the basis of our three items.

1. Those who a) are very satisfied with college life
   b) feel that what they are learning is worth while
   c) have a good or fair time
2. Those who a) are very satisfied with college life
   b) feel that what they are learning is not worth while or are undecided
   c) have a good or fair time
3. Those who a) are neither satisfied nor dissatisfied
   b) feel that what they are learning is not worth while or are undecided
   c) have a good or fair time
4. Those who a) are very dissatisfied with college life
   b) feel that what they are learning is not worth while or are undecided
   c) have a good or fair time
5. Those who a) are very dissatisfied with college life
   b) feel that what they are learning is not worth while or are undecided
   c) have a miserable time

For purposes of illustration, all deviation was reducible in our example. In practice, however, complete reducibility of deviation is rarely possible without combining all categories of all items, thereby resulting in no discrimination at all.

When the amount of deviation is sufficiently reduced to make further combination of categories impractical, there is the problem of how to score the few remaining deviants (the deviation presumably having been reducible to 15% or less). Suppose we had had such a response combination as a–a–c on our

three items by the time we had done all practical category combination (Fig. 5). By scoring a–a–c with a–a–a&b we would have only one deviant response: (c) on item 3. Any other scoring, as, for example, with c–b&c–c, would leave at least two deviant responses: (a) on item 1 and (a) on item 2. Maximum reproducibility of response from the scale score is, therefore, the principle one would ordinarily desire to follow in the scoring of deviants. (It occasionally happens that a deviant can be scored in several different ways and still permit of maximum reproducibility. The indeterminacy arises if the number of items is small and can be removed by using more items. Usually the indeterminacy is harmless, however, and it is sufficient to give such deviants the most neutral of the several best possible scale scores.)

When many items and/or categories are involved, it is obviously too cumbersome to work with such tables as those above (Figs. 3, 4, 5), where all the *possible* combinations of response are shown. It is not difficult, however, to work with similar tables allowing space only for the response combinations actually obtained. By omitting from the table all those response combinations which have a zero frequency, the resulting abbreviated table is convenient. To illustrate, we could have set up the first table in our example with the three items on adjustment to college life (Fig. 3) in the manner shown below (Fig. 7).

a			b				c						Item 1.
a		b	b		c		b			c			Item 2.
a	b	a	a	b	a	b	a	b	c	a	b	c	Item 3.
20		5	15	5				25	10			20	Ideal Freq.
15	5	5	5	5	5	5	5	10	30	5	5	0	Obtained Freq.
1		2	3	4				5	6			7	Scale Type

Figure 7

In the course of our discussion we have seen that it is possible to determine from the marginal frequencies of a set of items what the scale types should theoretically be for those items and for the population responding to them. Then, by comparing these with the response combinations obtained and by combining categories, if necessary, we have observed how the existence of a scale can be established, how the remaining deviation can be determined, and what the principles are which govern the scoring of deviants.

In conclusion, it is important to remember an assumption which has made possible the procedure outlined. Everything that we did involved the premise that the hierarchy of category within each item was reasonably correct to begin with, even where we made combinations of category. If the content of our categories had been such that no assumptions could have been made as to their relative positive or negative value under each item, we could not have set up an initial ideal scale for the items, a step on which our entire procedure was dependent.

From the practical standpoint, this limitation is not too important for work in the field of attitude and opinion, since the order of categories within items can usually be judged beforehand with sufficient accuracy. In some cases, however, it may be difficult to do this. Any of the techniques for scale analysis can handle this problem of determining category order "blindly"; but it will ordinarily involve far more labor than in the case (such as that outlined in this paper) where the correctness of *a priori* judgments is assumed. The tabulation technique of this paper is being extended to include this most general case where the category order is not known.

A STUDY OF THE USE OF MECHANICAL APTITUDE TESTS IN THE SELECTION OF TRAINEES FOR MECHANICAL OCCUPATIONS

J. W. McDANIEL
Bakersfield Junior College
AND
WM. A. REYNOLDS
Sacramento Air Service Command

WARTIME dislocation of the labor market in the direction of mechanical occupations emphasizes a need for selective screening of trainees. Postwar return to trade, service, and professional occupations will demand still greater attention to applicants for retraining. If schools are to retain control over their programs, they must provide for increased vocational guidance for youth just preparing to enter the labor market and for adults seeking occupational readjustment. Increased guidance demands improved methods for determining potential occupational fitness. Training programs now in the secondary schools give the schools a fine opportunity for developing selection and guidance procedures useful during wartime and indispensable in vocational relocation after the war.

The ideal test of job fitness is a tryout experience under job conditions and under expert observation. The practical limitations on the wide use of this selective device necessitates construction of substitutes. Two general types of such substitutes have been devised. One type of measuring instrument is a miniature work sample in which effort is made to duplicate the work situation under measurable conditions. Another type of instrument attempts to analyze the measurable abstract elements of the job activities. This type may reduce the situation to elements that can be tapped in a language form or other visual pattern and results in pencil-and-paper tests of aptitude. A number of these tests are on the market, and some

of them claim high correspondence with actual work success. For most of them very limited data are available showing their relationship to trainability of potential workers. The great need is for specific local evidence of usefulness of such tests in selecting trainees for middle level occupations.

This paper reports a study begun in the spring semester of 1942 at the Kern County Union High School and Bakersfield Junior College for the purpose of forming a test battery to predict success in mechanical training courses. The study was based on the results of administering three tests purporting to measure mechanical aptitude to 206 students, of whom 112 were in high-school classes and 94 in National Defense Training programs. Trainees in machine shop, aircraft engines, aircraft mechanics, wood shop, and welding were tested on the *Bennett Test of Mechanical Comprehension,* the *MacQuarrie Mechanical Ability Test,* and the *O'Rourke Test of Mechanical Ability, Junior Grade, Form C.*

The criterion of success used to validate the tests was the median rating on four traits given the trainee by the instructor. After careful instructions in the use of the mechanical aptitude rating scale the instructors rated the trainees on: (1) aptitude for learning as evidenced by ability to understand and apply instructions to the job, (2) speed and accuracy as evidenced by ability to acquire muscular and manipulative skills, (3) workmanship as evidenced by quality and precision of work done, and (4) interest-enthusiasm as evidenced by eagerness in getting at the job and staying with it. Ten-point scales were constructed and behavior descriptions placed underneath various points on the scales.

Results

Of the 206 students, 197 were males and 19 were females. The females and those who had incomplete test scores were eliminated, leaving 147 males in the validating group. The means and standard deviations of the various tests for this group are presented in Table 1. The data on the high-school students and National Defense trainees are presented separately. Although the National Defense group is superior on

the Bennett and O'Rourke tests, the critical ratios between the two groups do not exceed 2.7,[1] and for the purposes of this study the two groups may be considered to be comparable.

The intercorrelations of the subtests of the battery are shown in Table 2. Since the standard error of an r of zero for 147 cases is .082, it is seen that only forty-two of the intercorrelations are significantly greater than three times the standard error of a chance correlation. However, an attempt was

TABLE 1

The Means and Standard Deviations of the Subtests of the Mechanical Aptitude Test Battery for the Groups Used in the Validation Study

Test	High School (N = 80)		National Defense (N = 67)		Total (N = 147)	
	M	S.D.	M	S.D.	M	S.D.
Bennett	40.25	8.80	44.02	8.12	41.97	8.70
MacQuarrie 1	38.31	8.79	39.51	7.74	38.86	8.35
MacQuarrie 2	38.31	6.90	40.58	7.70	39.35	7.36
MacQuarrie 3	20.20	3.00	20.10	3.37	20.15	3.17
MacQuarrie 4	39.69	12.54	40.21	14.96	39.93	13.70
MacQuarrie 5	21.13	8.04	22.92	9.16	21.94	8.61
MacQuarrie 6	13.50	6.67	15.35	6.34	14.34	6.59
MacQuarrie 7	20.75	4.44	20.32	6.16	20.55	5.55
MacQuarrie total ...	63.85	9.74	66.24	11.99	64.94	10.89
O'Rourke I	80.26	17.92	86.06	12.86	82.91	16.08
O'Rourke II	152.50	40.45	168.00	38.82	159.56	40.46
O'Rourke total	232.50	52.13	252.78	49.69	241.74	52.03
Criterion (ratings) ..	5.58	1.40	5.70	1.51	5.63	1.45

made to combine some of the subtests so that a significantly higher multiple-correlation coefficient would be obtained.

The first combination of subtests to be tried consisted of subtests B, M_1, M_3 and O_1, as these had higher coefficients with the criterion while at the same time having lower correlations with the other tests. The corrected[2] multiple correlation coefficient was found to be .33, and the combination was rejected as being too low in predictive power.

The second battery tried was the combination of all sub-

[1] A critical ratio ($D./S.D._{diff.}$) of 3.0 is considered to indicate an almost certain difference between two groups.

[2] Ezekiel, M. *Methods of Correlation Analysis.* John Wiley & Sons, Inc., New York, 1930, p. 177. This correction is for a limited number of cases and for the number of variables, and estimates the probable correlation for the universe from which the data were drawn.

tests, excluding the totals of the MacQuarrie[3] and O'Rourke tests. The corrected multiple-*R* was .43. When the predicted criterion scores were correlated with the obtained criterion scores the correlation was found to be slightly, but not significantly, higher, or .45.[4] Because of the labor in forecasting from ten tests and because the efficiency of prediction is but 10.7%

TABLE 2

Intercorrelations of the Subtests of the Mechanical Aptitude Battery for 147 Male Trainees

	M_1	M_2	M_3	M_4	M_5	M_6	M_7	O_1	O_2	O_3	M	C
B	.11	.13	.16	.43	.39	.56	.21	.37	.56	.55	.48	.24
M_1		.18	.32	.17	.12	.20	.23	−.02	.05	.03	.51	.22
M_2			.31	.22	.28	.15	.34	−.08	.05	.04	.47	−.17
M_3				.18	.43	.22	.30	.05	.09	.12	.62	.22
M_4					.55	.50	.41	.30	.29	.34	.73	.21
M_5						.53	.34	−.01	.31	.34	.78	.10
M_6							.49	.39	.43	.53	.67	.22
M_7								.14	.14	.06	.65	.12
O_1									.52	.81	.28	.21
O_2										.96	.33	.28
O_3											.51	.26
M_8												.14

S.D.$_{r=0}$ = .082

Legend:

B = Bennett Test of Mechanical Comprehension
M_1 = MacQuarrie Tracing
M_2 = MacQuarrie Tapping
M_3 = MacQuarrie Dotting
M_4 = MacQuarrie Copying
M_5 = MacQuarrie Location
M_6 = MacQuarrie Blocks
M_7 = MacQuarrie Pursuit
M_8 = MacQuarrie total score
O_1 = O'Rourke Mech. Apt., Part I
O_2 = O'Rourke, Part II
O_3 = O'Rourke, total score
C = Criterion (instructors' ratings)

better than chance for this battery, a combination was sought which would contain fewer tests but would give as high an efficiency of prediction.

The third trial battery consisted of the seven tests B, M_1, M_2, M_3, M_4, M_5 and O_2. The corrected multiple-correlation coefficient was found to be .45, and when computed by correlating predicted with obtained criterion scores, .47. The effi-

[3] The total of the MacQuarrie Test never entered into any other combination. Since its correlation with the criterion is lower than some of its subtests, the addition to a battery merely attenuates the multiple-correlation coefficient.

[4] A multiple-*R* computed from the Beta weights should equal exactly the *R* obtained by correlating the predicted scores with the obtained scores. The differences were due to (1) errors in the facilitating tables which were used in making the predictions, when the four-place numbers were rounded off to two places, and (2) errors due to grouping not compensated for entirely by Sheppard's correction.

TABLE 3

The Multiple Correlation Coefficients of the Four Trial Batteries and their Efficiencies in Prediction

Tests in battery	*R*	*E*
1. B, M_1, M_3, O_1	.33	.056
2. B, M_1, M_2, M_3, M_4, M_5, M_6, M_7, O_1, O_2	.45	.107
3. B, M_1, M_2, M_3, M_4, M_5, O_2	.47	.117
4. B, M_1, M_2, M_3, M_4	.41	.088

ciency of prediction for this battery was slightly better, being 11.7% better than chance.

A fourth battery was tried, consisting of the five tests B, M_1, M_2, M_3, and M_4, and the corrected multiple-*R* was .42. The correlation between the predicted and criterion scores showed a slight drop to .41. The efficiency of prediction for this battery was thus only 8.79% better than chance.

The coefficients of multiple-correlation for the four trial batteries are summarized in Table 3. The efficiency of prediction for each multiple-*R* is shown in the last right-hand column.

Since the multiple-correlation coefficient of the third battery indicates that it is the best of the obtained combinations, the predicted scores were correlated with the obtained criterion scores for each separate class of mechanical work.[5] The data were summarized in Table 4.

From Table 4 it may be noted that the multiple-*R* varies

TABLE 4

The Correlations between Obtained and Predicted Criterion Scores for Each Mechanical Class

Class	Group	Instructor	N	Observed criterion		Predicted criterion		*R*
				M	S.D.	M	S.D.	
Machine Shop	High school	P	36	5.97	1.41	5.73	.55	.60
Machine Shop	Nat. Def.	P	15	6.73	1.15	6.26	.69	.38
A/C Mechanics	Nat. Def.	R	24	5.92	1.19	5.73	.47	.48
Woodshop	High school	Sc	23	5.13	.95	5.50	.44	.37
Welding	High school	St	21	5.38	1.59	5.63	.88	.27
Welding	Nat. Def.	St	14	5.79	1.80	5.19	.90	.42
A/C Machine	Nat. Def.	Ro	14	4.14	.43	5.33	.39	−.42
All classes	H.S. & N.D.	..	147	5.63	1.45	5.64	.67	.47

[5] The raw-score regression equation for the third battery is $.013(B) + .028(M_1) - .057(M_2) + .112(M_3) + .019(M_4) - .022(M_5) + .007(O_2) + 2.540$.

widely from class to class. The coefficient for the high-school Machine Shop class, $R = .60$, is sufficiently high for forecasting purposes, while for the National Defense A/C Machine Shop class, $R = -.42$, it is useless. An examination of the means and standard deviations of the classes shows that one instructor, Ro, rated much more severely than the others, and the negative correlation indicates a different standard of scoring in that class. It is possible that the results of the study would have been affected in the direction of greater forecasting efficiency if the data for this class had been omitted.

The small number of cases in the classes, however, should be noted as a factor introducing unreliability in the results shown in Table 4, as strict comparability between the instructors' ratings could not be obtained by transmuting them to a scale with a common mean and sigma. Perhaps more important than this is the fact that the ratings were taken to the nearest whole number on a ten-point scale, and were not sufficiently fine for meaningful transmutation.

TABLE 5

Regression Weights of the Subtests of the Mechanical Aptitude Test Battery

Test	Symbol	Weight
Bennett	B	.0788
MacQuarrie Tracing	M_1	.1580
MacQuarrie Tapping	M_2	−.2878
MacQuarrie Dotting	M_3	.2439
MacQuarrie Copying	M_4	.1796
MacQuarrie Location	M_5	−.1306
O'Rourke, Part II (Gen. Mech. Info.)	O_2	.2027

Further evidence for the validity of the forecasting equation was obtained by predicting the scores of the nineteen women not included in the validating group. Fourteen of them were in a class on Aircraft Engines, under an instructor not listed in Table 4, and five women were in the National Defense A/C Machine Shop class listed in Table 4. The multiple-R for this group was .78. The coefficient is slightly greater than three times the standard error of an r of zero for 19 cases.

The regression coefficients (Beta weights) for the tests are given in Table 5.

It is evident from the relative magnitudes of the Beta weights that the MacQuarrie Tapping and Dotting Tests, and the O'Rourke General Information Test contribute the most to the forecasting efficiency of the battery.

Summary and Conclusions

1. Three standardized tests of mechanical aptitude were administered to 147 high-school students and National Defense trainees in five mechanical training courses.

2. From the three major tests a combination of seven subtests was selected which had a multiple-correlation coefficient with the criterion of instructors' ratings of .47. It is probable that this value would have been raised if two criterion measures had been obtained and an estimate of the true correlation of the battery with the criterion had been made.

3. The forecasting efficiency of the battery differed for the five training courses, but its over-all value is significant in showing that prediction formulas need not be confined to but one type of training. Evidence, while not conclusive, was obtained that the formula would forecast a new group with an efficiency greater than if no correlation obtained.

4. Weightings of the subtests of the battery indicate that the MacQuarrie Tapping and Dotting Tests, with the O'Rourke General Mechanical Information Test, contribute most to the forecasting efficiency of the battery.

A VALIDATING STUDY OF THE OBERLIN VOCATIONAL INTEREST INQUIRY

L. D. HARTSON
Oberlin College

IN THE YEAR 1927–28 W. H. Brentlinger and the present author devised a *Vocational Interest Inquiry* for use in connection with the counselling service which was at that time one of the responsibilities of the Department of Psychology at Oberlin College. Inasmuch as a description of this *Inquiry* may be found in Fryer's *Measurement of Interests* (1), it will be unnecessary to reproduce it here. A statement may well be made, however, as to the hunch which motivated the construction of this particular form of inquiry. A rather detailed classification had just been completed of the occupations in which the Oberlin alumni were engaged (2). This experience suggested the desirability of a vocational inquiry from the results of which a man's interests could be classified in terms of the general type of function which appealed to him most strongly. A list of twenty functions was therefore formulated, quite *a priori,* and enough items selected to permit a paired comparison between each function and each of the nineteen others. The *Inquiry* involves, therefore, 190 pairs of comparisons and yields a score in each of the following twenty categories:

I. Creative Activities
II. Research
III. Social Investigation
IV. Diagnosis
V. Compilation of Previously Discovered Facts
VI. Oral or Written Presentation of Reports
VII. Financial Speculation
VIII. Deeds of Prowess
IX. Formulation of Policies
X. Detailed Planning of Work
XI. Executive Management of Personnel
XII. Practical Construction Problems
XIII. Routine Activities
XIV. Evaluation of Conduct, Achievement or Product
XV. Arbitration
XVI. Administration of Advice
XVII. Selling Ideas or Commodities
XVIII. Teaching
XIX. Offering Service or Aid
XX. Professional Entertainment

The principal use made of the *Inquiry* was as an aid in the counselling of students. With a change in the administrative setup, made in 1928, with reference to vocational counselling, use of the *Inquiry* was discontinued. In order that some conclusion might be reached as to the validity of this form of vocational inquiry, a follow-up study was initiated in 1941 by E. B. Knauft and the author. Copies of the blank were mailed to 178 men who were the original subjects. Responses were received from 121, or 68 per cent of the list. It is unfortunate that the population is not large enough to furnish more definitive information concerning the characteristic patterns of interest for contrasting vocational groups. The number is large enough, however, to furnish some suggestions as to the consistency of individual interest patterns over the period of fourteen years—time enough to permit most of the men to become established in their professions.

Validation of the Inquiry

1. *Extent of Agreement between the Patterns of Interest Indicated by the Inquiries of 1927 and 1941.* By ranking the functions on the basis of the frequency with which they were preferred, it is possible to compute rank difference correlations between the two sets of choices. For the total population of 121 the consistency of choices on the two occasions is indicated by an r of .717 $\pm$ .077 (see Table 1). The correlations for the different vocational groups range between .899, for the 12 men in the field of social science, to .282 for five accountants; for nine individuals who could not be fitted into any group classification, from .842 to .063. The table also reports the correlations for three special aggregates. For the nine artists and musicians in this sample, consistency of interest is represented by a correlation of .889; for the 27 college teachers, by an r of .804, and for the 30 men in business and industry, by an r of .668.

2. *Agreement between the 1927 and 1941 Responses, as Indicated by the Most and Least Favored Functions.* Table 2 reports the three most favored and three least interesting functions, on the occasion of each of the *Inquiries,* for each sub-

group. This table shows that in the case of those groups for which the correlation between the two responses showed a correlation as high as .726, at least one of the functions was among the three most favored on both occasions, and with all but two

TABLE 1

Correlations between Test and Re-Test
Oberlin Vocational Interest Inquiry

Occupational group	N	r	P.E.
Social Scientists	12	.899	.030
Artists	4	.870	.038
College Language Teachers	8	.804	.056
Musicians	5	.746	.070
Librarians	2	.746	.070
Ministers	3	.726	.075
Physicians	8	.726	.075
Physical Scientists	6	.726	.075
Industrialists	7	.648	.092
Chemists	7	.618	.098
Biologists	5	.618	.098
Advertising Managers	2	.618	.098
Bankers	6	.558	.108
Retailers	9	.507	.117
Lawyers	7	.446	.126
Physical Education Instructors	3	.393	.133
Geologists	3	.393	.133
Secondary School Men	10	.292	.144
Accountants	5	.282	.145
Air Corps Instructor	1	.842	.046
Social Worker	1	.832	.048
Personnel Man	1	.558	.108
Actuary	1	.467	.123
Editor	1	.436	.128
Director, Social Planning	1	.385	.135
Criminal Court Psychologist	1	.344	.139
Editor	1	.292	.144
Agent, Transportation	1	.063	.157
Total population	121	.717	.077
Combined groups:			
Artists and Musicians	9	.889	.033
Business and Industry	30	.668	.087
College Teachers	27	.804	.056

of the groups this is true of two or three of the functions. When one turns to the least preferred functions, it is desirable to eliminate from consideration function XIII (Routine Activities), since that is almost universally unpopular. No other function is commonly eschewed, but at least one of the other two functions which was least interesting on the first occasion

TABLE 2

Functions of the Oberlin Vocational Interest Inquiry Most and Least Preferred by Each Occupational Group

	N	Most preferred		Least preferred	
		1927 test	1941 test	1927 test	1941 test
Social Scientists	12	2– 4–14	4– 9– 2	13– 8–20	13– 8–20
Artists	4	1– 2–10	2– 1–18	13–17–15	7– 8–13
College Language Teachers	8	1– 2–14	1– 2–14	13– 7–12	7– 8–17
Musicians	5	9–18–20	20– 1–16	8– 3–12	8–12–13
Librarians	2	9–15–11	2– 6– 9	12–13– 8	12–13– 8
Ministers	3	6– 9–14	14– 6–15	12– 7–13	12– 7– 8
Physicians	8	19– 2– 4	4–16–19	13– 5– 7	13– 6– 7
Physical Scientists	6	2– 1–12	2– 4– 1	17–16–15– 3	13–17–20
Industrialists	7	8– 4–11	1– 9– 2	5–13– 7	7–13–20
Chemists	7	2–12– 8	2– 1– 9	6– 5–20	13– 7–17
Biologists	5	1– 8– 4	1– 4– 9	7– 6–13	13– 7–17
Advertising Managers	2	7– 9–11	9–11–16	13–12– 6–18	12–20–19
Bankers	6	1– 2– 8–11	16– 9– 4	20– 5–13	6–12–13–20
Retailers	9	8– 2– 1	9– 4–16	13–17–20	12–13– 5
Lawyers	7	1– 8–20	15–16–18	13– 5–10	13– 7–12
Physical Education Instructors	3	19– 8– 1– 2– 4	1–10– 9	13– 6– 5	13– 6–20
Geologists	3	1–11–20	2– 1– 4	7–13–17–19	13– 8–15– 6
Secondary School Men	10	8–15–19	2– 1– 4	13– 7– 5	7–13–20
Accountants	5	4–11– 3	14– 2–11	6–10–15–17	8– 6–13
Air Corps Instructor	1	1– 4– 8– 9	1– 2– 4–11–14	5–13– 6–15	20–13– 6
Social Worker	1	18–11–19	15–11–18	5– 6– 2–10–13	5– 6–10–13
Personnel Man	1	3–14– 9	15–19–16	12– 5–13–20	13– 2– 5– 6–12
Actuary	1	1– 7– 2	2– 9– 1	15– 6–13–17	8–15– 7–20
Editor	1	5– 4–20	12– 4– 5– 9–11	7–16–18	7–15–13
Director, Social Planning	1	9–11– 1– 5	2– 9–16–18	2–12–13	8– 3–13–15–20
Criminal Court Psychologist	1	8–12– 1	2– 1–19	20–17– 7	2–13– 7
Editor	1	1– 8–19	9–11– 4	13–10–16– 5	20–12–13
Agent, Transportation	1	8–19–12	2– 4– 1– 5	3– 5– 6– 7– 9–13–14	7–13– 8
Total population	121	1– 2– 4	1– 4– 2	13–17–12	13– 7–12

is found at the bottom of the list in 1941 with all groups for whom the over-all correlations between the two series of choices is at least .648, as well as with three other vocational groups where the correlation is lower than that figure.

3. *Agreement of the Profiles with Empirical Judgment as to the Functions Characterizing the Different Vocations.* Examination of Table 2 shows that the pattern of preferred functions shows marked contrasts when one vocation is compared with another, and that they conform almost without exception to common sense expectation. Examination of the responses made in the 1941 *Inquiry* shows, e.g., that the three functions chosen most frequently by the social scientists are: Diagnosis, Formulation of Policies, and Research. In response to the initial *Inquiry,* this group showed a strong interest, also, in Evaluation of Conduct. On the other hand, they displayed least interest in Routine Activities, Deeds of Prowess, and Professional Entertainment. The physicians show a distinctly different pattern. Their initial preferences were for Diagnosis, Research, and Offering Service or Aid, but by the time they had begun the practice of medicine, the function of Administration of Advice had displaced Research. The physical scientists showed a similar preference for Research and Creative Activities, but substituted Diagnosis for their initial choice of Practical Construction Problems. The group of college teachers who were working in the general area of the languages report unanimity in their first three choices on both occasions: Creative Activities, Research, and Evaluation of Achievement or Product. The types of activity most attractive to the clergymen are: Oral Presentation of Reports, Evaluation of Conduct, and either the Formulation of Policies or Arbitration (the settlement of disagreements). The final preferences of the lawyers differ widely from the undergraduate choices. They present a logical combination: Arbitration, the Administration of Advice, and Teaching.

On the other hand, there are instances in which the pattern chosen seems unrelated to the occupation. This is notably the case with the men in the field of secondary education, whose more recent interests lie in the field of Creative Activities,

Research, and Diagnosis (of difficulties). The teaching function does not appear among their most favored activities. Review of their vocational careers shows, however, that, in half of the cases, the teaching profession was chosen only after another vocation had first been tried. Again, one would expect Financial Speculation (activities aimed at financial profit) to appear among the most interesting functions of the business men. This appears to be true, however, only in the initial *Inquiry,* and then only with the advertising managers. These facts suggest the desirability of an analysis of the items which were chosen to represent those functions to see to what extent they are truly representative.

An Item Analysis

In order to lay the groundwork for a possible revision of the *Inquiry,* the individual items have been examined, first, for the purpose of eliminating those that are non-differentiating, and, second, for the purpose of selecting those representative of the functions having the greatest predictive value. The non-differentiating items were located by the process of computing the proportional preference given to each item in the 1941 *Inquiry.* Of the 380 items in the *Inquiry,* 184 were preferred by 70 per cent or more of the subjects and were therefore eliminated. Then, after the subjects had been grouped according to the vocation in which they were engaged in 1941, the relative popularity of the 196 items was computed for each vocational group. Examination of these proportions revealed 45 more items which were not distinctive of any vocation in which these particular men were engaged. Their elimination reduced the total to 151 items. One consequence of this procedure was the reduction of the number of items for some of the vocational categories to less than 16. The number of categories having at least 16 items was six, the largest number of items for any category being 37. The identifying names being used for these categories are: 1) Commerce; 2) Merchandising; 3) Law and Social Science; 4) Medical and Social Work; 5) Physical Science, and 6) Literature. Because of the inequality in number of items under each category it became necessary to use pro-

portions rather than summations of items in making comparisons of relative interest for the different activities.

The next step consisted in re-scoring the original responses on this selection of items to determine the extent to which the respondents' original answers would have predicted their final vocational choice. At this stage the men engaged in Art and Music were eliminated because too few items were found which differentiated these vocations. This elimination reduced the test population to 112. (It should be noted that in order to re-score on these 151 selected items it was necessary to carry 104 pairs of items—including 57 undifferential items.) When the original inventories were re-scored on these 151 items it was found that 63, or 56.2 per cent of the men had the highest score in that category in which it would be most logical to classify the work in which they were actually engaged in 1941.

Further examination of the items suggested the possible advantage of making a still more drastic selection of items. In order to equalize numbers it was decided to select just the ten items in each vocational category which were most highly differential. For this part of the study use was also made of the responses made on the original *Inquiry* by two additional groups of subjects, 27 students in the Hamma Divinity School, and 90 secretaries in city YMCA's in Ohio. The responses of these groups were studied with the possibility of finding items specific to the field of religious work. This quest proved, however, to be fruitless.

With this final item selection, consisting of ten items for each of six categories, the Oberlin graduates who had responded to the second *Inquiry* were again tabulated on the basis of their first choice among the six vocational categories. (In addition to these 60 significant items it was necessary to retain 32 indifferent items, thus making a total of 92 items, or 46 pairs.) Classification of these men under these six categories on the basis of their actual final vocation shows that 56.1 per cent of them engaged in fields in the area in which they made the highest scores as seniors.

The vocational history of 47 other men who had filled out the *Inquiry* as seniors, but who had not responded to our second

Inquiry, being available, their original responses were scored with the 60-item form. The results in the case of these men give a 66.7 predictive percentage, 32 of the 48 men having chosen an occupation in the one of the six areas for which they scored highest in the *Inquiry.*

As a final step in the validating analysis, the 60 items of the abbreviated *Inquiry* were classified on the basis of the twenty functions which had been used in constructing the original *Inquiry.* When these were parcelled out in terms of the patterns characterizing the interests expressed by the various vocational groups (see Table 2), the number of items for each vocation proved to be too small to yield significant differential scores.

Summary and Conclusions

1. A validating follow-up has been made of the *Oberlin Vocational Interest Inquiry,* after an interval of fourteen years, based upon the responses of 68 per cent of the men tested in the year 1927–28. In an item analysis use was also made of responses from 90 secretaries of urban YMCA's and 27 students in a theological seminary.

2. When the correlation is computed between the rank order of interest expressed on the two occasions, 1927 and 1941, in the vocational functions sampled by the *Inquiry,* the coefficient for the entire group of 121 is .717.

3. Examination of the patterns of preferred functions shows marked contrasts between the different vocational groups represented, and agreement with common sense expectations.

4. Preliminary steps were taken toward a possible revision of the *Inquiry* in the form of item analyses aimed at eliminating non-differentiating items. This process showed that, on the basis of the interest shown in the particular items used in this *Inquiry,* these men fell into six categories which have been labelled as follows: 1) Commerce, 2) Merchandising, 3) Law and Social Science, 4) Medical and Social Work, 5) Physical Science, and 6) Literature.

5. The item study revealed 151 of the original 380 items which had been differentially selected by the members of these six vocational groups. When the original 1927 *Inquiry* was

re-scored, using only these 151 items, 56.2 per cent of the men made highest proportional scores in the vocational area in which they subsequently chose their life work.

6. The ten most highly differentiating items were selected for each of the six vocational categories, this constituting a further reduction of the total number of items to 60. Scores obtained from the original responses of the 121 men on this 60-item *Inquiry* give first choice to that category which most closely corresponds to the final vocational choice in the case of 56.1 per cent of them.

7. Finally, the responses made in 1927 by 47 men who did not answer the second request were scored on the 60-item *Inquiry,* and with this group it was found that, in two-thirds of the cases, the first choice was given that category represented by the vocation subsequently chosen.

8. It is to be regretted that the small size and specialized character of the population involved in this study precludes the use of more refined statistical procedures for item differentiation (3). The results, however, appear to harmonize with those obtained by assigning multiple regression weights to the items. They furnish further evidence, moreover, of the possibility of predicting vocational choices of college seniors within areas which stress particular functional interests.

REFERENCES

1. Fryer, Douglas. *Measurement of Interests.* New York: Holt, 1931, 38–40.
2. Hartson, L. D. "The Vocational Stability of Oberlin Alumni." *The Personnel Journal,* VII (1928), 176–185.
3. Kuder, G. Frederic. "A Review of Edward K. Strong's *Vocational Interests of Men and Women.*" *Psychometrika,* IX (1944), 147–148.

GUIDANCE SURVEY OF STUDENT PROBLEMS

ELIZABETH GORDON ANDREWS
Florida State College for Women

THIS investigation was undertaken as a contribution to a curriculum study being made by a sub-committee of the Faculty Committee concerned with the functioning of personnel work and guidance on the campus of the Florida State College for Women. The students who secured the data were graduate students in a class in Personnel Work in 1941–'42.

These investigators visited as many of the girls as were found in their dormitory rooms when called upon. All students at the college reside in dormitories (or in approved student houses). The dormitories were divided between the two investigators. If a student was not in her room at the time the visitor called she was not included in the study. A total of 279 students, or 14 per cent of the total student body, were thus interviewed.

Each interviewee was presented with a sheet entitled "Guidance Survey." On this sheet were indicated the purpose of the study, a suggestive list of problems which the student might have had since entrance to college, a list of the possible sources of help that she might have consulted, and an example of the information desired. This study does not include the numerous times students are called to administrative and other offices. We limited our study to problems on which students voluntarily sought assistance.

Only those problems were recorded which assumed somewhat serious proportions. For example, the investigator would say, "Have you had any health problems since you have been in college? By health problems, we do not mean the times you may have gone to the infirmary to have your throat swabbed, but instances in which your health was such as to definitely

affect your school work." Disciplinary problems included not only infraction of rules but also interpretation of rules. Extra-curricular problems included the case of need for dropping some activities as well as need for increasing them. All types of problems are defined on the sample sheet.

One of the chief factors in causing unreliability of report is due to the uncertainty of memory. For example, freshmen report homesickness as a problem more than upper-classmen. However, this may be partly due to the selection that occurs and the elimination of the homesick as well as the poorer students.

Sources of Help

Table 1 indicates the frequency with which the various offices or individuals on the campus served the students inter-

TABLE 1

Frequency of Voluntary Requests for Aid

Number included in study, 279. Student body, 2007.

Source of help	Number of counsellors involved	Number of times sought*	Average per person
Academic Dean	4	105	26.2
Business Office	2	9	4.5
Faculty Advisers	60	99	1.5
Heads of Departments	25	30	1.2
Infirmary	2	77	38.5
Office of Dean of Students	2	10	5.0
Office of Director of Personnel	1	197	197.0
Registrar's Office	1	22	22.0
Religious Secretaries	4	45	11.2
Social Directors	10	85	8.5
Student Counsellors	50	62	1.2
Teachers (other than Faculty Advisers)	140	149	1.1
	301	890	

* Number of times sought refers to number of times aid was sought from the indicated sources, not to number of different students.

viewed with regard to their problems.

Both upper-classmen and freshmen report that they consult the Registrar's office solely regarding such problems as courses, credits, schedules, cuts and such matters as pertain to registration.

The Business Office is sought by both groups chiefly with

regard to financial matters related to college accounts. Twice they reported seeking aid in personal problems but in both these cases the student had a personal friend in this office.

The Dean of Student's Office functioned chiefly in three areas insofar as students voluntarily seek help from this office: extra-curricular problems, personal problems, and discipline.

The four areas in which the Personnel Office was most frequently sought were: educational, financial, vocational, and placement problems. While personal problems were seldom

TABLE 2

Distribution between Freshmen and Upper Classes

	Freshmen		Upper-Classmen		Total	
	No.	%*	No.	%*	No.	%*
Academic Deans	25	7.5	80	14.4	105	11.8
Business Office	5	1.5	4	0.7	9	1.0
Faculty Advisers	57	17.1	42	7.5	99	11.1
Heads of Departments	4	1.2	26	4.7	30	3.4
Infirmary	35	10.5	42	7.5	77	8.7
Office of Dean of Students	3	0.9	7	1.3	10	1.1
Office of Director of Personnel	62	18.6	135	24.2	197	22.1
Registrar	9	2.7	13	2.3	22	2.5
Religious Secretaries	7	2.1	38	6.8	45	5.1
Social Directors	37	11.1	48	8.6	85	9.6
Student Counsellors	34	10.2	28	5.0	62	7.0
Teachers (other than Faculty Advisers)	55	16.5	94	16.9	149	16.7
	333	99.9	557	99.9	890	100.1

* The percentages given refer to the relation of the number of times aid was sought from the indicated sources by the designated group to the total times aid was sought by the group in question (Freshmen, Upper-Classmen, or Total).

listed this is perhaps due to the objective approach to problems in this office which avoids labelling personal problems as such. Placement is peculiarly a problem of upper-classmen, especially of seniors; hence it is to be expected that freshmen would not be concerned with this function of the Personnel Office. With this exception, upper-classmen and freshmen consulted the office most frequently on the same problem areas.

The Infirmary was, of course, sought mostly in matters of health, with occasional related problems in which advice was sought from the physician or nurse.

The Office of the Director of Residence was sought a limited

number of times chiefly in regard to homesickness, roommate difficulty and occasional personal problems.

According to student reports, Social Directors are sought infrequently, but on a widely divergent list of problems including educational, religious, financial, health, vocational, personal, and disciplinary problems. It seems that the type of service the Directors in dormitories render most to the students lies in the field of personal problems.

Religious Secretaries are sought by students chiefly with regard to religious problems. The number of times the Secretary is sought seems to be much greater with upper-classmen than with freshmen. This may indicate that the Secretaries become increasingly helpful as they come to know the students longer, or it may indicate that religious problems are more prevalent among upper-classmen than among freshmen. A previous study on this campus would, however, indicate that the problems in this area are more prevalent in the earlier years.

The Student Counsellors were seldom sought regarding financial, religious, health, and placement problems. Their chief service includes assistance in educational, extra-curricular, and disciplinary problems.

Educational, personal, and vocational difficulties constitute the three outstanding problems about which Faculty Advisers are consulted. The small number of times Faculty Advisers were sought voluntarily was somewhat disturbing, but no doubt one cause of this is the difficulty of finding an hour at which the student and the Faculty Adviser have corresponding free time for conference. This again points to the need for Faculty Advisers to be given a reduced teaching load in order that they may devote more time to counselling.

It is evident from the student reports that Academic Deans assist students mainly with vocational and educational problems. This does not indicate vocational guidance so much as counsel with regard to pre-professional courses, such as pre-medical courses, courses for nurses, teachers, etc.

Freshmen consulted the Heads of Departments only on educational problems while upper-classmen conferred with them on problems of finance, extra-curricular activities, place-

ment, and vocational guidance. This is probably due to the fact that freshmen have very little occasion to become acquainted with Heads of Departments until they have chosen their major field, which frequently is not until the latter part of the sophomore year.

Teachers other than Faculty Advisers make a valuable contribution to the guidance program by giving satisfactory help on educational and vocational problems. They are also often sought by upper-classmen regarding placement problems. They may be sought in any or all fields of guidance, but are not called on frequently in problem areas other than education and the vocations.

If the nine types of problems were ranked according to the frequency with which students reported that they sought help on these problems, the results would be as given in Table 3.

TABLE 3

Nature of Problems in Which Help is Sought

Freshmen			Upper-classmen		
Problem	No. times help sought	% of total*	Problem	No. times help sought	% of total*
1. Educational	139	40.3	1. Educational	199	34.8
2. Personal	60	17.4	2. Finance	70	12.2
3. Vocational	50	14.5	3. Vocational	70	12.2
4. Health	36	10.4	4. Personal	65	11.4
5. Finance	33	9.6	5. Health	43	7.5
6. Extra-curricular ...	11	3.2	6. Placement	43	7.5
7. Discipline	9	2.6	7. Religious	37	6.5
8. Religious	7	2.0	8. Extra-curricular ...	30	5.2
9. Placement	0	0.0	9. Discipline	15	2.6
	345	100.0		572	99.9

* The percentages given refer to the relation of the number of times help was sought in the indicated type of problems by the designated group to the total number of times help was sought on all problems by the group in question.

From Table 3 it is apparent that the problems that trouble both groups most are the educational ones, and this is the field in which students feel the most pressing need for assistance. Freshmen appear to need more help than upper-classmen with personal problems. Perhaps this is due to the more obvious

sophistication of the upper-classmen. Vocational problems rank high with both groups, indicating that selection of vocation and preparation for a vocation are not confined to the first year but are also problems during the later years of college.

Problems of discipline, religious and extra-curricular matters are not so great a source of disturbance apparently as are other problems. Perhaps students fail to recognize them as problems and hence do not seek help with them. Students seek help most in educational, vocational, personal, financial, and health problems. The attention of Counsellors might be directed toward improvement of assistance in those areas in which stu-

TABLE 4

Help Voluntarily Sought by Students (according to records) in Personnel Office

	No. of requests	Record percentage	Survey percentage
Financial	426	35	41
Educational	362	30	27
Personal	131	10	02
Vocational	109	08	15
Placement	109	08	14
Health	65	05	01
Extra-curricular	34	03	00
Religious	7	01	00
	1243	100	100

dents report seeking help most frequently, and further investigation should be made to determine whether problems actually exist in other areas where students are unaware that they need counsel.

During the interviews, forty-eight students reported that they had had problems about which they had not sought help. Twenty of these cases were personal problems, the remainder being distributed over all the other fields. It is apparent that personal problems constitute the oustanding area in which students realize that they need guidance but hesitate to ask for help.

Out of the sixteen possible sources of official assistance available to students on the campus, this survey reveals that the six offices or individuals sought most frequently by students include in order of decreasing frequency (1) Office of the Director

of Personnel, (2) Teachers other than Faculty Advisers, (3) Academic Deans, (4) Faculty Advisers, (5) Social Directors, and (6) the Infirmary.

In Table 4 it will be noted that the actual problems in which help was sought by students during the period of time covered by the survey are very much in the same order as reported by the students, indicating that the reports were fairly accurate and that the sampling by the method used was quite representative. The only change in order would be placing the Personal problems below Vocational and Placement problems. As stated previously, this is probably due to the approach in the Personnel Office which seeks to minimize the "personal" problem in favor of a more objective approach. At the same time the confidential records of the office indicate the personal problem involved.

INTERPRETATION OF THE KUDER PREFERENCE RECORD FOR COLLEGE STUDENTS OF HOME ECONOMICS

RUTH T. LEHMAN
The Ohio State University

For the past several years, the *Kuder Preference Record* has been used experimentally with freshman students, in connection with a rather extensive guidance program in the School of Home Economics of the Ohio State University. This experimentation has shown that the *Record* makes a helpful contribution to the total picture of the individual which is needed by the counsellor, suggesting both vocational and avocational interests.

However, interpretation of interest profiles has presented serious difficulties. Some have assumed that, since the home economics curriculum has traditionally been built upon a base of natural science, performance interests in that area should be strong; that, in fact, students who have little interest in scientific activities should be barred from entering or continuing in the field of home economics. Yet interest scores in science and marks received in science courses by home economics students have been found frequently to be in direct contradiction. Similarly, one might expect to find a pattern of interests which is characteristic of home economists. Such has not proved to be the case. The weakness of the assumption is evident when one surveys the diverse fields which the graduate in home economics may enter. She may become a teacher, an extension worker, a hospital dietitian, a foods manager in a restaurant, or she may enter one of the numerous divisions of business or of social service. Obviously, it would be dangerous to base interpretation of an interest profile either on one's prejudices, or on a guess as to areas which are significant for specific occupations requiring a home economics background.

Such difficulties in interpreting the *Record* blocked its effective use with college freshmen in home economics. Therefore, the test was given experimentally to a sample of home economics teachers, dietitians, and home economists who were employed by utility and household equipment companies. Findings from this preliminary work indicated that there were real differences in interests of the three groups and encouraged an extension of the study. Other cases were added during the school year of 1943–44.

The Study Reported

To date the *Record* has been checked by 239 home economists. These are distributed as follows: 125 secondary-school teachers, 42 hospital dietitians and 72 home economics women in business. Of the teachers, 51 were volunteers from a summer institute held for Ohio vocational teachers; 74 others in the State were reached through meetings called by their city supervisors. The hospital dietitians were secured through group meetings in several Ohio cities, and through a random sampling of the Ohio Dietetic Association. The business women were from various parts of the United States. They represent a random sampling of the extensive membership list of the Home Economics in Business department of the American Home Economics Association, supplemented by a smaller number of Ohio women not included in this list. Of the business women, 10 were engaged in restaurant or tea-room management, 11 in journalism, and 20 in foods promotion or experimental work, and 31 were employed by utility and household equipment companies. All three groups of home economists represented a wide range—but a fairly good balance—in terms of experience in their respective fields (Table 1).

Form B of the *Kuder Preference Record* was used, except in the early part of the study when only Form A was available. In order that all data might be used, the raw scores secured on Form A were changed to comparable scores on the later form by means of a transmutation table provided by the author of the test. Medians were found in each interest area and their percentile equivalents located on a profile sheet. Mention

TABLE 1

Distribution of 239 Home Economists According to Years of Experience in Their Respective Fields

Years of experience	Teachers		Hospital dietitians		Business women	
	No.	%	No.	%	No.	%
1–4	27	22	15	36	23	32
5–9	17	14	12	29	18	25
10–19	37	30	8	19	22	31
20–	43	34	2	5	7	10
No data	1	*	5	12	2	3
Total	125	100	42	101	72	101

* Less than 1 per cent.

should be made also of the fact that only a part of the total group received scores in the mechanical and clerical areas, since these areas were not included in the early form. (See footnotes to the various tables.)

While the interest patterns of different persons as revealed by the test were highly individual, there appeared to be quite distinct differences among the three groups of home economists included in the study (Table 2). The teachers and dietitians had high social service interests; the business women were somewhat lower. The dietitians were outstanding in science interests; the other two groups were lower, although still above the average for college freshmen. The dietitians were also

TABLE 2

Median Percentile Scores of Home Economists in the Nine Interest Areas of the Kuder Preference Record

Professional group	Mechanical*	Computational	Scientific	Persuasive	Artistic	Literary	Musical	Social Service	Clerical*
Teachers ..... (N = 125)	57	43	63	12	71	37	29	83	34
Hospital dietitians .... (N = 42)	45	63	82	7	52	43	39	80	34
Business women ..... (N = 72)	49	43	60	51	59	53	29	62	23

* In the mechanical and clerical areas, scores were not available for 51 of the teachers, 12 of the dietitians and 17 of the business women.

much higher in the computational area than were the teachers and business women. The teachers surpassed the others in artistic interests; the business women, in the persuasive or selling area.

In other words, the areas of highest interest for the teachers were artistic and social service, median percentile scores in those areas being 71 and 83, respectively. In fact, over three-fourths of the teachers (77 and 78 per cent, respectively) had scores at or above the median for college freshmen in these areas. There was some evidence also of scientific interest, but this was not nearly so high as in the case of the dietitians. A breakdown of the teacher group in terms of years of experience shows that this pattern of activity preferences is consistent (Table 3).

TABLE 3

Median Percentile Scores of Home Economics Teachers when Classified as to Years of Experience

Years of experience	Mechanical*	Computational	Scientific	Persuasive	Artistic	Literary	Musical	Social Service	Clerical*
1–4 (N = 27)	73	41	64	12	62	37	35	89	39
5–9 (N = 17)	67	31	69	3	68	20	34	83	13
10–19 (N = 37)	63	46	51	15	67	37	22	85	39
20– (N = 43)	55	50	64	13	75	43	25	78	37

* Scores in mechanical and clerical areas were not available for 51 of the teachers. Therefore, in the 1–4 yr. group, N = 4; 5–9 yrs. 6; 10–19 yrs. 22; and 20 years and over, 41.

An apparent gain in artistic interests and loss in the social service area in the case of the teachers having the longest term of service may be revealing.

The hospital dietitians, though fewer in number than the teachers, also presented a clear pattern of interests. Outstanding areas were computational, scientific, and social service. Median percentile scores in these areas were 63, 82, and 80, respectively. Moreover, around three-fourths of the dietitians

had scores above the 49th percentile (69, 76, and 79 per cent in the respective areas).

Interestingly enough, though the business women differed in certain respects from the teachers and dietitians, they showed no definite preference pattern. Interests in as many as five or six areas appeared to be similar (Table 2). However, when this group was broken down in terms of occupation within the business field, differences did appear (Table 4). Certainty as

TABLE 4

Median Percentile Scores of Business Home Economists when Classified as to Business Group

Business group	Mechanical	Computational	Scientific	Persuasive	Artistic	Literary	Musical	Social Service	Clerical
Restaurant and Tea room ..... (N = 10)	57	71	64	47	76	32	18	50	32
Foods Promotion .... (N = 20)	45	59	78	20	48	58	34	64	23
Home Service and Equipment ... (N = 31)	62*	31	54	68	58	49	25	68	20*
Journalism ..... (N = 11)	36	38	47	48	78	71	38	57	26

* In the mechanical and clerical areas, scores were not available for 17 of the home service and equipment women.

to how real these differences are will depend upon evidence provided by additional cases, for the numbers representing the different occupations were small. Interests apparent in restaurant and tea-room managers were computational, scientific, and artistic (71, 64, and 76 being the respective medians, and 70, 90, and 60 being the respective per cents above the 49th percentile norm). Similarly, apparent interests of the women in foods promotion and experimentation were in the scientific area (median percentile 78, with 80 per cent above the 49th percentile norm); of women in home service and equipment, in persuasive (selling), social service, and probably mechanical areas (medians of 68, 68, and 62, with 68, 68, and 79 per cent of the cases, respectively, above 49). Interests of the journalists were

centered in literary and artistic areas (medians of 71 and 78, in each case 82 per cent being above 49).*

Use of the Findings in the Guidance of College Home Economics Students

The foregoing findings suggest certain conclusions concerning the interpretation of interest profiles for home economics students.

1. The study does not reveal a pattern of interests which is characteristic of home economists as a group.

2. However, the student who is considering home economics as a field or who is already enrolled in it can profitably compare her own interests with the outstanding preferences of those actively engaged in various professions requiring a home economics background.

3. Such comparison should serve as the basis for a discussion of specific activities in the field being considered which call for certain interest patterns. For example, the scientific interests of the hospital dietitian are clearly used in the planning of special diets based on exact scientific facts; her computational interests in the keeping of necessary accounts, the estimation of diets of given composition, and the ordering of food supplies. Similarly, the artistic and social service interests of the home economics teacher should be related to creative activities in home making and to a desire to work with others and help them.

4. Ideally such discussion should eventually lead to exploratory experiences on the part of the student to discover her abilities and whether she really enjoys such activities. Perhaps this should follow particularly in those cases where test results and professional ambitions are in evident conflict.

5. In any case, however, the interest profile should be used in relation to other factors,— the student's personality, intelligence, special aptitudes, handicaps, health, and educational and experiential background. Left to herself, the student is likely

* Throughout the study, percentile norms for Form B as established for first year college men and women were used, rather than the more recent norms for high-school girls. The latter table would show the home economists higher in general than they are recorded in this paper in mechanical and literary interests, and somewhat lower in social service interests. It would also give even higher medians in some areas for various sub-groups.

to rely too much on test scores. Often she would like a test which would make decision on her part unnecessary. On the other hand, the inexperienced counselor with too great a respect for tests may use the profile in a dogmatic fashion or without supporting evidence.

6. Furthermore, it is important for both student and adviser to interpret the *Preference Record* in terms of what it claims to measure; namely, activity interests, not ability, nor appreciation. This has been found to be doubly important to remember in the artistic, writing, and musical performance areas, where ability or appreciation are so readily assumed to be the interpretation.

7. The counselor must keep in mind also that, although certain interest patterns appear in studies of given occupational groups, profiles are after all highly individual, reflecting both possible vocational and avocational interests, and may change with experience and maturity.

Further Work Needed

This account of the present investigation is in the nature of a progress report. Need for further study is evident. In the first place, the validity of the tentative findings for dietitians and home economists in business must be tested by increasing the number of cases. Then, too, data from other related professions—such as home economics extension, and the textiles and clothing area of business—should be added, if the findings are to be of greatest use to the counselor of home economics students.

Finally, certain general questions need to be studied. Among them are two which face every counselor who attempts to interpret students' interest scores. One of these is the big question of how much student activity preferences change during the four years in college and what are important factors in such change. The other is the basic question as to whether the pattern of interests revealed in a study of professional workers is closely related to experience in and knowledge of the job, or is more a reflection of the selective effects of the specific undergraduate curriculum which was followed.

THE USE OF STANDARDIZED READING TESTS IN TEACHERS COLLEGES[1]

ALFRED M. EWING
Texas Wesleyan College

WHAT is the most efficient way to use the results of reading tests? What is the most usable test in the reading field? What disposition is made of reading test scores? In an attempt to answer these and similar questions concerning the use made of standardized reading tests in teachers colleges, data were gathered by means of a mimeographed two-page twenty-seven-item questionnaire which was sent to 167 teachers colleges. One hundred three returned the questionnaire, making the percentage of returns, 61.7%, more than twice that of similar surveys in colleges and universities. No reading tests were given in 17 of these institutions, or a program was just beginning. Thus the data here given are from 86 institutions answering questions concerning the use made of reading tests and the use and interpretation of the results.

The 86 teachers colleges using reading tests reported the use of 27 tests. Four tests, the *Iowa Silent Reading Test,* the *Cooperative English Test* (*Form C2, Reading Comprehension*), the *Nelson-Denny Reading Test,* and the *Entrance and Classification Test for Teachers Colleges Entrants: English Test,* are used much more extensively than are any of the other 23 tests. In fact the four tests make up nearly three-fourths of all the tests, their respective percentages being: 35.5%, 20.0%, 10.3%, and 6.8%. This limited use of a wide variety of tests is accounted for by local use of the test, use by its author, or some other specific reason and not by general considerations such as ease of scoring, popularity of the test, or number of skills or abilities tested.

[1] This article is based on a study done in partial fulfillment of the requirement for the degree of Doctor of Education at Colorado State College of Education, Greeley, Colorado.

Reasons for Selecting Tests

The ability to diagnose reading difficulties is given as the main reason by 16% of the teachers colleges for selecting the reading tests which they administer to their students. Following closely is the fact that it "meets their needs," 14%. Simplicity of scoring, 10%; high reliability and validity, 9%; and recommendation or selection by authority, 9%, are other reasons frequently given by teachers colleges for selecting specific reading tests. Twenty-two other reasons for selecting reading tests are mentioned once or twice.

Practices in the Techniques of Testing

Four departments, psychology, testing, English, and personnel and guidance, administer the reading test in half of the teachers colleges. In the other half reading tests are administered by ten other agencies.

The faculty ranks first as the group most often *scoring* reading tests in teachers colleges. This includes such departments as English, psychology, etc. There seems to be, from the data obtained, no one department by which the scoring is generally done outside of the faculty and assistants.

The personnel and guidance office ranks first as a place where reading test scores are *filed*. The deans' and registrars' offices rank next while the English department ranks fourth.

The personnel and guidance office also ranks first as a place where the scores are available or *given out*. The adviser and dean rank second and third, respectively. In eight schools scores are not given out, while in many other schools more than one department gives out the test scores.

Fifty of the 86 schools give test results to the students. In three of the 50 schools the test scores are given only occasionally to the student and in six other schools they are available to him.

The Use Made of Reading Test Scores

The purpose of obtaining reading test scores, as stated by 40% of the teachers colleges, is to find the students who need help in reading. Twenty-two per cent more say for diagnosis, while 16% give appraisal of the student's reading ability as the

purpose. An analysis of these purposes shows a definite need for a good achievement test in reading as well as a diagnostic test.

The most common reason for giving reading tests is to select those students needing remedial help in reading. But an examination of the purposes given for obtaining reading test scores reveals other reasons for giving reading tests, such as determining daily lesson assignments, improving study habits and the like.

Half of the teachers colleges supplying data for this study use testing *alone* for selecting those students who need help in the improvement of reading. A fourth more use testing plus other items, while another fourth use no tests. This means that standardized tests were used in 75% of the schools for selecting students needing remedial reading.

Just how the results of reading tests are actually used may be best described by including excerpts from reports submitted by a number of teachers colleges:

In College A all students who are doing unsatisfactory work are interviewed by the personnel director. The reading test percentile ratings are compared with the percentile ratings on the psychological examination. If there is a marked discrepancy the student is told that he will be given help in the improvement of reading if he wishes it. Help is not confined, however, to those having such a discrepancy.

College B uses test scores to discover personal deficiencies in reading ability; to assist in placement of students in English classes according to reading ability level; to assist in counselling students; to assist students to help themselves; to assist in evaluating curriculum needs; to assist the students in detecting their own strengths and weaknesses.

At College C the scores are incorporated in the "Guidance Tests Record Profile" of the Cumulative Personnel Record. They are given to the students for the purpose of self-appraisal in terms of their own group and the national group. Open and frank discussion is entered into in regard to the possible reasons for a lower score in one test if there is a difference. Occasionally students reveal special conditions which are responsible for low

scores. Very few bona fide low scores exist and they are usually caused by lack of speed.

In College D test scores are used as one of the bases for advising students relative to the academic load they should carry. Instructors may consult records to determine probable student abilities. Deans and Advisers find the records valuable in giving them an index of the students' probable success, and a limited number of superior students are granted a partial tuition exemption. They prefer to select superior students rather than attempt to save (for teaching) those of inferior ability and attainments.

As an example of the use of reading tests in solving personnel problems, one of the teachers colleges makes the following statement from a five-year survey in the college. This college records data from several tests including one on the measurement of ability in reading. From the great variation in reading ability discovered, certain questions arose. What curricula do these poor readers enter? How long do they remain in college? What kinds of grades do they make?

The findings were: *Curricula*—physical education, agriculture, home economics. No one chose art, biology, chemistry, English, music, or physics as his major field. *Years in college*—the mortality rate of poor readers is exceedingly great. Only 70% are in school at the end of the first year, 45% at the end of the second year, 20% at the end of the third year, and 15% at the end of the fourth year. *Grades*—those that remain make grades comparable to grades of other college students.

Plans Used in the Remedial Reading Program

Twenty of the 86 teachers colleges have specialized reading classes for improving the reading ability of the students; fifteen have both a specialized reading class and a reading clinic, while eleven report only reading clinics. Thirteen schools use special sections of certain courses, while nearly equally as many apparently give no concern to reading. The clinic and special classes, however, account for over 51% of the 86 schools whose attention is drawn to actual improvement.

Small schools, that is those below 500 enrollment, give

slightly more attention to reading than do larger schools, but the difference is not significant.

How some of the plans for improving reading actually operate is seen from the examples given, one each for a reading clinic, a laboratory, an individual conference method, and an orientation course.

From a *reading clinic*—One of the least gratifying aspects of the program has been the uncertainty of results. In some instances visiting classes all day, conducting a conference with teachers after school, and spending extra hours in conversation have produced no tangible evidence of change in the instructional program. However, most teachers show a keen interest in the questions discussed.

But tangible results are sometimes, oftentimes, almost overwhelming. Witness the case of Miss F, a college girl who made the following record from the analysis of her eye movements as photographed by the ophthalmograph.

1944	*Jan. 7*	*Feb. 26*	*May 10*
Rate of reading (wpm)	226	286	320
Fixations	112	100	84
Regressions	30	20	16
Average word span recognition	.89	1.6	1.2
Average duration of fixation in seconds	.24	.21	.2

The increase of 94 words per minute can be readily appreciated when practically applied to the work of a student. That means 5640 more words per hour provided the rate can be maintained; and assuming she reads five hours a day, five days a week, her *increased* reading achievement rises to an impressive 141,000 words per week, or over four books of 30,000 words each.

A *laboratory reports* that the word "laboratory" was used because it implied a broader, more general use than the word "clinic" and did not limit the function to diagnosis and correction. The members of the class learn how to set up and maintain case histories; how to operate certain simple equipment, how to administer, score, and interpret many kinds of tests; and how to locate and assemble this essential information and data in practical situations. Students learn to think of tests as aids and guides, not as infallible conclusions.

In a case of *individual help* the director of reading improvement listed the lowest quarter of the freshman class for special help as indicated by results of the *Iowa Reading Test,* then interviewed the staff for freshman reading assignments in college subjects, read the assignment himself, and made objective comprehension questions on the content. The students read the assignments silently in the presence of the director; they were told to read carefully but were urged not to hurry. Then they answered from what they remembered. At the end of a time another form of the reading test was given. The improvement was statistically significant. This type of work is good but it is not always possible to schedule a special class. Little extra time was required for they read the assignments that they had to read anyway.

One teachers college used the *orientation* course to improve reading ability under the following topical ideas: Discussion of reading as a tool, relationship of speed and comprehension; administration of timed informal tests—the students were required to find specific answers to questions in their assignment; use of association tests, in which the student is given a word or two and writes all he knows about these words during a minute or two; development by students of informal tests, true and false, completion, etc.; use of assignments to provide for individual differences by noting books that are easy or difficult; check of visual and auditory efficiency of students whose rate is low.

Recommendations

On the basis of the data obtained from the cooperating teachers colleges, the following recommendations are made:

1. More teachers colleges should stress remedial reading. Forty-one of the 86 schools said they felt their reading program was fairly satisfactory, 33 were dissatisfied, eight were undecided, three did not indicate, and one school said it had no problem in reading.

2. There is a definite need for both a good achievement test in reading and a good diagnostic test.

3. Remedial reading should have a classroom approach as well as a clinical approach for both speed and comprehension.

4. Marked improvement can be made without the use of expensive apparatus such as metronoscopes, tachistoscopes, films, and corrective reading manuals, by giving a little time to practice, drawing attention to a few efficiency devices in better reading, and using mimeographed materials.

5. Follow-up tests should be administered to determine the permanency of the results of remedial reading programs.

6. With less attention than one realizes reading can be improved. For example, the student's attention can be drawn to discarding useless motions, such as pointing, head or lip movements, or whispering, to making fewer and shorter fixations, to seeing phrases and sentences at a glance, to anticipating what the author is going to say instead of passively attempting to absorb his ideas, and to practicing reading at a "faster than convenient" rate.

MEASUREMENT IN THE CONTINUOUS SELECTION AND COUNSELING OF STUDENTS IN A COLLEGE OF PHYSICAL EDUCATION AND SOCIAL WORK

J. E. TODD*
The Institute of Paper Chemistry, Appleton, Wisconsin

SPRINGFIELD COLLEGE is seeking to solve through research and measurement some of the problems confronting it in the selection and training of leaders of youth for positions as teachers, program directors, and directors of social agencies, such as the Y.M.C.A., Boys' Clubs, settlements, Boy Scouts, camps, parks, recreation centers, and other agencies of informal education. Those in charge of the personnel services recognize two clear lines of responsibility. One is the function of selecting and making sure that only those who are competent are admitted and certified to the professional ranks. The other is the function of counseling the individual in order that he will find the right road for himself and make progress toward his professional goal.

1. *Discovering Candidates* (14)

Two-thirds of the suitable candidates for admission are discovered by present students and alumni of the college who as physical directors, Y.M.C.A. secretaries, high-school teachers, and social workers are in close association with high-school boys. Rather complete admission data are required—viz., high-school transcript, ratings by principal and others, scholastic aptitude test scores, medical history, and personal history. Each candidate is interviewed by at least one member of the Alumni Admissions Committee or the College Admissions Committee, persons who can judge the applicant as a

* Formerly Director of Admissions and Student Relations, Chairman of the Freshman Year, Springfield College, 1937–1941.

potential professional man. Admission is based on intellectual competence, personal and social adjustment, leadership ability, health, physical qualifications, finances, and interest in a profession for which the college educates.

2. *Continuous Counseling and Selection*

The college provides for continuous counseling services through the college course beginning with the orientation program of "Freshman Days" (4), which includes getting settled in the dormitory, registration, testing, social affairs, and explanations of procedures and traditions, and which is carried out to a large extent by a committee of upper-classmen.

The Common Freshman Year (13) was begun in 1937 to provide general education to meet the needs of students in adjusting themselves to the college community and life's responsibilities in a career of youth leadership.

A series of psychological and educational tests of abilities, achievements, adjustments, and interests (1) and a series of physical tests of organic and physical efficiency, motor ability, posture, and nutrition (7) form the basis of a thorough program of selection and counseling throughout the student's career in college.

In the group guidance course, "Introduction to Education," carrying six semester hours credit for the year, individual results of the tests are given to the students and interpreted as an aid to self-appraisal and self-direction. Along with these are considered the student's adjustment to college life, the meaning and purpose of higher education, methods of study, efficient reading, and vocational and educational planning. In the winter term, consideration is given to health adjustments and personal hygiene; and in the spring term, to religious, ethical and socio-vocational adjustments. Against all these, the student checks his own qualifications and maps out his curricular plans for the next year and the remainder of his college course. He makes application for admission to the professional division of his choice and all admissions and freshman-year records of the student, including a profile of all aptitude, achievement, personality, and physical tests, accompany the application to

the professional division with the recommendation of the student's advisor and the Chairman of the Freshman year. Each freshman is interviewed by the Divisional Admissions Committee and is accepted or counseled as to dropping out of college or transferring to another more appropriate college. Thus the orientation course, the testing program, and counseling not only form the bases of sound guidance to the student, but also give many opportunities for objective appraisal of the student and careful selection for the professional divisions.

Students enter the professional divisions at the beginning of the Sophomore year. Each man is assigned to a special counselor who helps him plan his program for the next three years and supervises his work during the year. All men carry a full program of Liberal Arts and Science courses selected to serve preprofessional values. Continued development in recreational skills is required. At the end of the year, students participate in the College Sophomore Testing Program. The Sophomore year is a transition from general to professional education. Advisors and divisional officers using grades, test scores, and ratings, appraise carefully each man and make decisions regarding him. The promising men are encouraged to continue, and the doubtful men are advised to plan other channels of endeavor.

The individual counseling by faculty members of the professional divisions continues in the Junior year. The course of study includes several professional courses, and two or three advanced courses in liberal subjects are required. Supervised field work begins in the local schools and social agencies, which gives practical experience and tests the professional aptitude and interests of the student. In the Senior year, counseling by divisional advisors, usually by the professional divisional directors themselves, continues. The proportion of professional study increases and the program becomes almost entirely professional. Students can concentrate in their particular fields of interest. Field work increases and emphasizes experience in supervision and is more critically appraised.

Placement plans by the four-year men are made and credentials are filed in the college placement office. Correspondence

and interviews with employers are arranged. The recommendation of men for particular jobs is the responsibility of the professional staff of each division. Final decisions and plans regarding the fifth-year program or other graduate study are made by those students who are qualified.

Those continuing for the fifth year increase their professional study and field work and complete their theses or research projects if they are candidates for the Master's Degree. The same general program continues on this level with even closer faculty-student relations in all professional and educational matters.

Every student is expected to spend one or more summers in work experiences of educational significance. Most of the students become camp counselors, camp directors, playground and beach supervisors, or serve on the regular staff of some social agency which does not have a special summer program. Reports of these summer's experiences are required.

The intimate social relations and physical conditions of dormitory life are influential factors in the development of students. Supervision of the dormitories is in the hands of a committee composed of faculty and students. Upper-class counselors, chosen by the dormitory committee, counsel students concerning dormitory adjustments and personal questions. Meetings of these counselors are held regularly, and a program of educating the counselors to more effective service is carried on.

Thus throughout the college program, continuous selection and counseling procedures are in effect and make use of psychological and physical measurements.

3. *Descriptive and Predictive Values of Tests and Measurements*

Measurement is useful in making decisions in selection and counseling because of its descriptive and predictive values. The following pre-war data have been chosen as being more typical of the normal functioning of the college than data available in the war years. The data in Table 1 give a picture of the *average* freshman student. These averages are the result of

the various selective factors leading to enrollment in Springfield College. These selective factors appear to be operating successfully. In the opinion of the administration, the averages obtained represent the type most suitable in terms of the function of the College.

TABLE 1

Test Score Description of the Average Springfield College Freshman Student

A. Pre-admission Data (14), class entering in 1940	
Freshmen admitted	132
Per cent of applicants	52
Students admitted ranking in upper half of high-school graduating class:	
Per cent of freshman class	60
Church members, % of freshman class	80
Protestants, % of freshman class	88
Catholics, % of freshman class	10
Jewish, % of freshman class	2
Mean score on 1937 *A.C.E. Psychological Examination* (pre-admission)	169.72
Percentile (national norms) for Liberal Arts College Freshmen	52

Principal's Ratings (9)[1]

	Mean	*S.D.*
Integrity	6.79	.70
Social attitude	5.75	.98
Emotional control	5.57	1.05
Leadership ability	5.28	1.14
Intellectual ability	4.64	1.12
Initiative	4.45	1.37
Scholastic zeal	4.24	1.00

B. Post-admission Data (1)

1. Psychological and Educational Tests—class entering 1940

	N	*Mean*	*S.D.*	*Percentile (National College Freshman Norms)*
A.C.E. Psychological Examination (1938 edition)				
Linguistic	131	49.14	14.05	50
Quantitative	131	28.32	6.99	65
Total score	131	77.00	18.20	58
Cooperative Literary Comprehension Test, Form C				
Speed	130	58.90	7.48	60
Level	130	56.90	6.60	50
Cooperative English Test (O.M.)				
Total	130	50.40	8.90	30
Cooperative General Culture Test				
Social Studies	131	36.20	18.50	52
Foreign Literature	131	21.65	13.30	40
Fine Arts	131	30.53	16.00	37
Science	131	49.10	14.10	60
Mathematics	131	19.52	8.00	60
Total Score	131	156.85	55.50	48

[1] The scales on which the ratings are based extend from 0 at the lower end to 8 at the high end.

TABLE 1 (*Continued*)

Allport-Vernon Study of Values				
Religious	131	34.66	7.08	85
Political	131	33.61	6.51	75
Social	131	32.10	5.34	70
Theoretical	131	29.19	5.94	55
Economic	131	29.08	5.58	55
Aesthetic	131	21.34	6.33	20
Bell Adjustment Inventory				
Home	114	3.94	3.40	"good"
Health	114	5.29	3.14	"average"
Social	114	9.26	6.40	"aggressive"
Emotional	114	6.63	5.22	"average"

Strong Vocational Interest Blank (Revised Form for Men)

	Average rating of three classes entering in 1938, 1939, 1940
Artist	C+
Bacteriologist	C+
Architect	C+
Physician	B−
Dentist	C+
Mathematician	C+
Engineer	C+
Chemist	C+
Production Manager	B−
Mathematics—Science Teacher	B
Y.M.C.A. Physical Director	B+
Personnel Director	B−
Y.M.C.A. Secretary	B−
Social Science Teacher	B
City School Superintendent	C+
Minister	C+
Musician	B
C.P.A.	C+
Accountant	C+
Office Worker	B−
Purchasing Agent	C+
Sales Manager	B−
Real Estate Salesman	B
Life Insurance Salesman	B−
Advertising man	B−
Lawyer	B−
Author—Journalist	C+

2. Comparison of Certain Achievement Test Results

	National Norms for Liberal Arts Colleges, Median Score, Percentile
Cooperative English Test, Form O.M. (1)	
Class of 1942	
September, 1938, Entering Freshman	35
March, 1939, Freshman	53
April, 1940, Sophomore	53
Class of 1943	
September, 1939, Freshman	31
April, 1941, Sophomore	61
Cooperative General Culture Test	
Class of 1942	
September, 1938, Freshman	55
April, 1940, Sophomore	60

TABLE 1 (*Continued*)

Class of 1943		
September, 1939, Freshman	50	
April, 1941, Sophomore	65	
3. Physical Tests (7) for classes entering as indicated		
Test	*Mean*	*S.D.*
Height—		
1939–40	69.10 inches	2.47
1940–41	68.71 inches	2.56
Weight—		
1939–40	156.84 pounds	17.00
1940–41	158.82 pounds	16.00
McCurdy-Larson Organic Efficiency Test (circulatory respiratory function)		
1938–39	185.20	89.08
1939–40	202.05	88.50
Cosen's General Motor Ability Test		
1939–40	345.06	80.36
1940–41	339.92	71.49
Springfield General Motor Capacity Test		
1939–40	236.53	13.54
1940–41	242.39	18.10
Springfield Muscular Strength Test		
1939–40	293.63	59.70
1940–41	299.71	89.18

Tests of agility, large and small muscle coordination, posture, and nutrition are also administered during the first term. Analysis of data indicates that the freshmen who expect to major in health and physical education are superior to those majoring in the other professional divisions in general motor ability and capacity, in general strength development, and in motor development.

A factor analysis of strength tests resulted in two components which can be measured by a few simple tests, viz., dynamic strength, which describes a composite motor ability criterion to the extent of 68%, and static dynamometrical strength, which was responsible for 24% of the reduction (8).

A factor analysis of 18 cardio-vascular test variables and the *McCurdy-Larson Test* and the *Tuttle Test* isolated eight principal components, viz., three concerned with pulse rates, two with blood pressures, two with pressures referring to postural changes, and one with circulatory recovery to exercise (11).

Other factor analyses of variables in specific sports, such as soccer, basketball, and other skills have been made by Kon-

stantinov (6), Tibbetts (12), Hunsicker (5), and others. Important theoretical and practical studies of posture and aquatics have been made by Cureton and of endurance and nutrition by Karpovich.

Table 2 gives some idea of the predictive relations between test scores and achievement. Measurement has been useful in predicting individual and group achievement.

TABLE 2

Prediction of Fall-Term Freshman Grade Index and English Grades from Pre-Admission and Post-Admission Data

1. Fall-Term Grade Index (9)
   Correlations between
   0, Fall-Term Freshman Grade Index, and:
   1. 1937 *A.C.E. Psychological Examination* (pre-admission) ..... .593
   2. Percentile rank in high-school graduating class ..... .350
   3. Rating on *A.C.E. Personality Report, Revision B,* "Program and Purpose" ..... .272
   4. Principal's Rating, "Scholastic Zeal" ..... .287
   5. Principal's Rating, "Intellectual Ability" ..... .297
   6. 1938 *A.C.E. Psychological Examination* (post-admission) ..... .643

   Multiple Correlations
   $R_{0.12345} = .691$
   $R_{0.123} = .675$
   $R_{0.236} = .731$

   0, Fall-Term Freshman Grade Index (9), and
   1. Combined Fall and Winter Terms (Freshman Year) Grades ... .925
   2. End of First-Year grades ..... .924
   3. End of Second-Year grades ..... .772
   4. End of Third-Year grades ..... .725
   5. End of Fourth-Year grades ..... .752

2. Cooperative English Test (10)
   Correlations between
   0, Cooperative English Test, Total Score, and:
   1. High-School Grades ..... .327
   2. Percentile Rank in High-School Class ..... .199
   3. Completion part-score of 1937 *A.C.E. Psychological Examination* (pre-admission) ..... .485
   4. Artificial Language part-score of 1937 *A.C.E. Psychological Examination* (pre-admission) ..... .191
   5. Opposites part-score of 1937 *A.C.E. Test* (pre-admission) ..... .630
   6. Total Score of 1937 *A.C.E. Test* (pre-admission) ..... .488
   7. Other Language in High Schools ..... .294

   Multiple Correlations
   $R_{0.12345} = .706$
   $R_{0.2567} = .715$
   $R_{0.12567} = .721$
   $R_{0.2567} = .714$
   $R_{0.1256} = .692$
   $R_{0.125} = .691$

TABLE 2 (*Continued*)

3. Fall-Term English Grades (10)

Correlations between

0, Fall-Term Freshman English Grades, and:

1. High-School English Grades	.497
2. Percentile Rank in High-School Class	.157
3. Size of High-School Class	.150
4. Completion part-score 1937 *A.C.E. Test*	.539
5. Artificial Language part-score *A.C.E. Test*	.179
6. Opposites part-score *A.C.E. Test*	.511
7. Total Score 1937 *A.C.E. Test*	.472
8. Other Language in High School	.257

Multiple Correlations

$R_{0.1234567} = .855$
$R_{0.123458} = .855$
$R_{0.1468} = .723$
$R_{0.148} = .708$
$R_{0.467} = .619$
$R_{0.46} = .618$

4. *Effectiveness of Program*

The ultimate test of the validity of the whole selection, counseling, and academic program is its effectiveness in preparing men for youth leadership. Pertinent to this subject are the data on academic mortality, placement, and professional stability given in Table 3. Data on Springfield College students for Part 1 of this table covered 8 years. The initial placement data in Part 2 of the table covered approximately 900 placements over 20 years. The data on permanence of the field of initial placement were collected 5 to 20 years after the initial placements involved. Strictly speaking, of course, a rigorous test of the effect of the program would require conducting a controlled experiment of such magnitude as to be impractical. However, it seems reasonable to believe that the relatively low academic mortality and the high placement and success in social work may be attributed in part to the use of measurement and prediction procedures in selection and counseling.

TABLE 3

Summary of Academic Mortality, Placement, and Professional Stability

1. Academic Mortality of the Classes of 1934, 1937, 1940, 1941, and 1942 (2)	
Loss during and at end of Freshman Year	
Springfield Average	24%
Public Controlled Institutions (16)	35.6%
Privately Controlled Institutions (16)	31.5%
Additional loss from beginning of Sophomore year to the time of graduation, classes of 1931 and 1937	21%

Of Freshmen lost from Springfield during first year, classes of 1941 and 1942

Poor scholarship	37%
Transfer to more appropriate institutions	30%
Financial causes	23%

Graduating at end of four years, classes of 1934 and 1937

Springfield	55%
Public Controlled Institutions (16)	27.7%
Privately Controlled Institutions (16)	34%

2. Placement (3)

Initial employment of 921 graduates during years 1921 to 1940

By position

1. Physical education positions	65.2%
2. Social group work positions	23.1%
3. General educational positions	2.0%
4. Graduate study	6.0%
5. Commerce and industry	3.7%
	100.0%

By agency

1. Schools and colleges	52%
2. Y.M.C.A.	26%
3. Other agencies	12%
4. Graduate study	6%
5. Commerce, industry, etc.	4%
	100%

3. Permanence of Field of Initial Placement (3)

Continuing in first or second position in same field	50%
Currently in original field	68.5%
Shifting between school, college, "Y," and other social agencies	21.5%
Shifting at least once into commerce, etc.	10.0%
Graduates who never leave the fields for which the college prepares	90%

REFERENCES

1. Arsenian, Seth. *Comparison of Three Freshman Classes in Scholastic Aptitude, Achievement, Evaluative Attitude, Adjustment, and Interest.* Springfield College, 1941. Mimeographed.
2. Arsenian, Seth. *A Study of Student Mortality in Springfield College.* Springfield College, 1940. Unpublished.
3. Domas, I. J. *A Study of Springfield College Graduates with the Bachelor's Degree, 1921–1940.* Springfield College, 1941. Unpublished Master's Thesis.
4. Frasher, C. B. *Freshman Week Programs.* Springfield College, 1936. Unpublished Master's Thesis.
5. Hunsicker, Paul. *A Mechanical Analysis of Chinning.* Springfield College, 1941. Unpublished Master's Thesis.
6. Konstantinov, Krum. *An Analysis of Some Soccer Skill Variables.* Springfield College, 1940. Unpublished Master's Thesis.

7. Larson, Leonard. *Physical Tests and Measurements.* Springfield College, 1941.
8. Larson, Leonard. "A Factor and Validity Analysis of Strength Variables and Tests with a Test Combination of Chinning, Dipping, and Vertical Jump." *Research Quarterly,* XI (1940), Q-281.
9. Matthews, John. *Predicting Academic Success of Freshmen.* Springfield College, 1941, Unpublished Master's Thesis.
10. Matthews, John. *Factors Predicting English Test Scores and Freshman English Grades.* 1940, Springfield College. Unpublished.
11. Quamme, H. J. *Factor Analysis of Cardio-Vascular Tests and Variables.* Springfield College, 1941, Unpublished Master's Thesis.
12. Tibbetts, H. N. *The Development and Evaluation of Potential Basketball Ability Variables and Tests.* Springfield College, 1940, Unpublished Master's Thesis.
13. Todd, J. E. *First Annual Report of the Common Freshman Year at Springfield College,* 1938. Unpublished.
14. Todd, J. E. *Annual Report of the Director of Admissions, Springfield College, 1939–40.* Unpublished.
15. Todd, J. E. *Social Norms and the Behavior of College Students.* Teachers College. Contributions to Education No. 833. New York: Bureau of Publications, Teachers College, Columbia University, 1941.
16. U. S. Office of Education. *College Student Mortality.* Bulletin, 1937. No. 11, Washington: U. S. Government Printing Office, 1938.

GUIDANCE THROUGH SELF-APPRAISAL

FORREST E. HEWITT
Howe Military School

IT IS well recognized that some guidance programs fail because the records become so elaborate and cumbersome that no one uses them. In the guidance program at Howe Military School, this difficulty has been overcome by arranging the material so that a student's problem can be ascertained with from three to five minutes of careful study. The cumulative record system is based upon the recognition of the following three problem fields:

(1) Self-guidance

If today's students are to be prepared to adjust themselves to this gadget-filled world of ours, it is most necessary that they be encouraged to self-guidance in the beginning of their high-school careers so that they can become more self-reliant, can make better choices, and will be better able to meet new situations wisely. This awakening to the realization that one must be able to guide himself is one of the most important single factors of an individual's early experience.

(2) Professional adjustment

Too many high schools have allowed their seniors to leave school with the sole ambition of going to college if their parents could afford to send them. Many of these youngsters have gone to college with no further aim than to join certain fraternities or sororities. Education again was incidental and the professional careers were too far removed for immediate consideration. Too often these graduates have found that they took the wrong courses and would probably have been happier if they had chosen other fields of interest. These people too often

become professional misfits and spend the rest of their lives wishing that they had chosen other careers.

(3) Self-appraisal

Students should and can be taught how to learn to appraise themselves, how to take advantage of opportunities for growth, and how to evaluate their progress. If a self-explanatory manual consisting of appraisal profiles and check sheets is assembled and written for the student needs of each particular school, the guidance program will not become lost in the daily factual teaching.

The source material for the Howe record system is recorded in profile form on a manila folder in which the cumulative material is filed. This information is compiled from the following sources:

(a) Technical information and personal inventory tests taken by the student.
(b) Reports from the Masters, Tactical Officers, the Headmaster, and the Commandant. (These reports give a cross section of the work habits, conduct, and social adjustments of the boy.)
(c) The Cadet's autobiography.
(d) Counselor's summary.

The Howe Profile System

During the four days of the orientation period prior to the fall term, a complete check is made on each of the entering student's achievements in the fundamentals of reading, language, mathematics, science, and the social studies. This battery is scored and placed on individual profiles showing the student's actual status in the tools of learning. This information is sent to the Masters who begin their "special help" periods for the new student with specified difficulties.

The entire program centers around the building of profiles showing achievements, interests, personality, and social adjustment. At various times during the school year all of the boys take a series of interest, personality, and special ability tests, the scores of which are placed on profiles by the Cadets for later

interpretation and analysis. Through the assistance of the counselor, each boy writes his *own appraisal* after drawing profiles of the various standardized tests.

The first of the series of tests is a check on their technical information in the ten major fields, namely: human relations, literature, government and history, biological sciences, physical sciences, machine shop, mathematics, business administration, office techniques, and architectural art. On this same profile the student's high-school training and occupational preferences are charted according to national norms for the academic level.

Each boy then takes a series of interest tests in the same ten major fields and compares these percentiles with his profiles in technical information, in occupational choices, and high-school training. These profiles are then compared with the vocational plans the student has outlined in his autobiography. Each boy writes a summary analysis of these profiles in the form of a letter or essay which is handed to the guidance counselor who interviews each boy in regard to his interpretation. These letters are then given to the English Master who checks them for grammatical errors and letter-writing form. The corrected copies are then returned to the counselor who sends them to the boys' parents with personal letters of explanation suggesting discussions between parents and sons during the spring vacation concerning the personal and vocational implications as shown by the profiles.

At the first opportunity after his return from vacation, the Cadet adds to his cumulative record in the guidance office the additional information gained in his home discussions. If it is the boy's senior year, this information is used as a basis for information in his future life plan. If he plans to attend college the next year, this information becomes the basis for his Freshman college conferences and is placed in a folder and sent to the college of his choice.

Previous to his senior year, special aptitude tests are given to the Cadet and a complete inventory accumulated during the years he attends Howe School. This personal inventory starts as soon as the student begins his formal life in the classrooms and the barracks, and accumulates from the following sources:

(1) Profiles of the boy's daily scholastic work which are checked by each Master under whom he is taking courses.
(2) Tactical Officers' reports showing a picture of the boy's adjustments to life in the barracks.
(3) Headmaster's profiles showing ratings of respect for authority, leadership, ability and willingness to co-operate.
(4) Commandant's report summarizing punishments and reactions.

Since the rating on many of these factors must of necessity be by subjective judgment, these profiles on the student's work habits, emotional control, cooperation, leadership qualities, and future plans are arrived at from various sources, thus giving a more reliable evaluation. This summary profile in the form of a personal adjustment inventory has proved invaluable for counseling purposes and is placed in the Cadet's cumulative record file in the guidance office.

After the analysis of the profiles and inventories, there is no attempt to pigeon-hole the student into a given profession or particular college. Instead, wise counseling is combined with student freedom of choice. The selection of professions is often born in the bi-monthly meetings of the College Preparatory Club. For the under-classmen the broad choice of whether the boy wants to work with ideas, things, or people very often comes from his study of the career data and charts in the guidance office. This selection of a career by including the boy in the program from its inception gives the boy the feeling of responsibility and security, as he knows that he has some definite and specific plans for his future which can be changed, if necessary, to meet new situations.

Use of the Autobiography

In order to help the high-school student to know himself, the autobiographical method has proved indispensable. One senior entering the school for the first time last fall, stated at the close of his autobiography, "I still don't know exactly what I want to do, but writing this has helped me to know myself

better, and I think by the close of the semester I will be able to make an intelligent decision."

During his Junior year, another boy decided that he wanted to become a chemical engineer, but when he and the counselor discussed his aptitude and achievement profiles, he was made aware of a definite weakness in mathematics. (The author believes that one of the most effective features in this technique is that it offers the counselor the opportunity to assist the student in discovering his own interests and deficiencies.)

When writing his autobiography, this boy stated that his father was too busy to discuss his personal and vocational problems with him. His counselor suggested that if the boy presented a definite plan to his father, he was sure that his busy father would take time to advise him. This Junior not only set up a definite program, but also followed the counselor's suggestions to try out different jobs during his vacation.

The broadening experience of this boy through the exploratory jobs, and the new rapport developed between father and son brought forth the proud statement from the boy when he returned to Howe for his Senior year, "Now I know my dad, and we decided that it would be better for me to change my career from engineering to dentistry." He went on to explain in his revised autobiography his reasons for changing his course, and gave in detail his new plans.

Autobiographies are written during the Freshman year and revised each consecutive year. They are considered absolutely confidential and are filed with other cumulative material in each student's guidance folder in the counselor's office. Certain parts of the following autobiographical outline are revised and brought up to date from time to time:

I. Life history
   (a) Ancestry
   (b) Description of home life
   (c) What the boy thinks the parents expect of him
II. Difficulties
   (a) School
   (b) Home
   (c) Social
   (d) Physical
   (e) Any other personal problems

III. Achievements
  (a) Records, medals, etc.
  (b) Sports
  (c) Jobs held
  (d) Money earned and money saved
IV. Interests, hobbies, and activities
  (a) Description of interest in hobbies
  (b) Amusements preferred
  (c) Reading interests
  (d) Travel
V. Emotional needs
  (a) Personal and social adjustment in school
  (b) Religious
VI. Life plans
  (a) Professional interests
  (b) Vocational experiences
  (c) Analysis of abilities in relationship to chosen field of occupation
  (d) College and technical school plans (Seniors)
VII. Summary
  A short interpretation of the implications of the test results in comparison with the autobiography and future plans as previously made with parents.

Each autobiography is read carefully by the counselor, and if it is incomplete or not well written, the paper must be revised and rewritten.

Practical Outcomes

This type of cumulative record offers the counselor both tangible and objective facts for interviewing each student. These records also help the student to decide upon more definite future plans, and offer an incentive for him to do much better school work. The profile system gives needed motivation for the superior as well as the average and poor students who have previously failed to work up to their ability levels. These objective records also bring to the students the importance of personality development and its effect upon their social and school life.

In meeting the needs of each student as an individual by teaching him how to study, how to choose and prepare for a vocation, how to get along with others, and how to interpret his experiences which will enable him to solve present and future problems, the plan is helping the boys to adjust themselves to the rapidly changing world into which they are being graduated.

MEASUREMENT ABSTRACTS*

Borow, Henry. "The Growth and Present Status of Occupational Testing." *Journal of Consulting Psychology,* VIII (1944), 70–79.

Tracing the development of psychological testing in this country, the author points out the close relationship between periods of socio-economic change and the rapid growth and refinement of measuring instruments and techniques. He indicates the principal men and organizations responsible for this progress which extends from World War I and the general mental ability test, through the depression era when job-placement testing became widespread, to the current wartime testing programs in the armed services and industry. The work of the Personnel Service Division of the Pennsylvania State College Extension Services is cited to illustrate present-day trends in employment psychology. While not infallible and admittedly subject to abuses, occupational testing is considered to have proved its worth and will play an important role in the postwar days to come. *Vernon S. Tracht.*

Brown, Fred. "An Examination in 'Preventive' Testing in the Kindergarten." *Mental Hygiene,* XXVIII (1944), 450–455.

This describes an experimental program instituted in the Minneapolis public school system whereby kindergarten teachers are trained to administer the *Stanford-Binet* scale to their own pupils. The purpose is to better enable these teachers to recognize and prevent early indications of childhood maladjustment. Thus, when they can observe their children individually in the testing situation and later carefully analyze test responses item by item, they can use the *Binet* as an important diagnostic tool rather than only as an index of comparison between children. *Vernon S. Tracht.*

Cattell, Raymond. "A Note on Correlation Clusters and Cluster Search Methods." *Psychometrika,* IX (1944), 169–184.

Four methods of determining the clusters in a correlation matrix are described and compared. The choice of method has to be made according to the size of the matrix and the type of cluster sought. The relativity of clusters is emphasized and a distinction is drawn between phenomenal clusters and nuclear clusters. The relative utility of clusters and factors is briefly commented upon. (Courtesy *Psychometrika.*)

Davis, Frederick B. "Fundamental Factors of Comprehension in Reading." *Psychometrika,* IX (1944), 185–197.

A survey of the literature was made to determine the skills involved in reading comprehension that are deemed most important by authorities. Multiple-choice test items were constructed to measure each of nine skills thus identified as basic. The intercorrelations of the nine skill scores were factored, each skill being weighted in the initial matrix roughly in proportion to its importance in reading comprehension, as judged by authorities. The principal components were rather readily interpretable in terms of the initial variables. Individual scores in components I and II are sufficiently reliable to warrant their use for practical purposes, and useful measures of other components could be provided by constructing the required number of additional items. The results also indicate need for workbooks to aid in improving students' use of basic reading skills. The study provides more detailed information regarding the skills measured by the *Cooperative Reading Comprehension Tests* than has heretofore been provided regarding the skills actually measured by any other

* Edited by Forrest A. Kingsbury.

widely used reading test. Statistical techniques for estimating the reliability coefficients of individual scores in principal-axes components, for determining whether component variances are greater than would be yielded by chance, and for calculating the significance of the differences between successive component variances are illustrated. (Courtesy *Psychometrika.*)

Grossman, David. "Technique for Weighting of Choices and Items on I.B.M. Scoring Machines." *Psychometrika,* IX (1944), 101–105.

A technique has been developed which permits the weighting of responses of test items on the I.B.M. scoring machine on the initial scoring, heretofore impossible. This is done by making the length of the response lines on the answer sheet longer or shorter as weights are needed. It is anticipated that this method will prove useful wherever differential weighting serves to increase the validity of tests. (Courtesy *Psychometrika.*)

Hastings, J. T. "Tensions and School Achievement Examinations." *Journal of Experimental Education,* XII (1944), 143–164.

This article describes a technique for differentiating pupils on the basis of tension intensity in examination situations, the purpose being to discover possible relationships between their tension ratings and examination scores. In the course of a semester, ninth-grade students in mathematics at the University of Chicago High School were given four examinations graded according to importance, length, and difficulty. A short questionnaire, which was designed to record their attitudes and feelings immediately following each, proved reliable by the split-half method (mean coefficient of .76) and valid by its correspondence with the Luria technique which was administered twice prior to each examination. Predictability of examination results from tension scores was found feasible, but other data regarding relationships between these two variables were considered suggestive rather than conclusive. *Vernon S. Tracht.*

Holzinger, Karl J. "Factoring Test Scores and Implications for the Method of Averages." *Psychometrika,* IX (1944), 155–167.

The general procedure and detailed steps for attaining complete factor analyses of scores are presented. Both orthogonal and oblique factors are considered. It is shown that a single average by conventional procedure gives an incomplete summarization of the data when the rank exceeds one. There should be as many averages as there are common factors. (Courtesy *Psychometrika.*)

Johnson, Palmer O. and Tsao, Fei. "Factorial Design in the Determination of Differential Limen Values." *Psychometrika,* IX (1944), 107–144.

This paper discusses the application of the principles of factorial design to an experiment in psychology. For the purpose of illustrating the principles, a simple experiment was designed dealing with the determination of the differential limen values of subjects for weights increasing at constant rates. The factorial design was of the type: 4 rates × 7 weights × 2 sexes × 2 sights × 2 dates. The appropriate statistical analysis for this type of design is the analysis of variance. The mathematical formulation of the problem was specified and the appropriate solution for the specific problem was obtained. Greater precision results from this type of design, in comparison with the traditional psychological experiment dealing with a single factor, in that measures are obtained of the effect of each of a number of factors together with their interactions. (Courtesy *Psychometrika.*)

Krathwohl, W. G. "A 3 by 3 Analysis of the Predictive Value of Test Scores." *Journal of Applied Psychology,* XXVIII (1944), 318–322.

Because correlations between educational test scores and academic achievement are usually too low to be used for predictive purposes, another method of determining the relation between achievement and ability has been developed. Percentile scores on a general ability test were divided into three groups, (1) above the 75th percentile, (2) between the 25th and 75th percentiles, (3) below the 25th percentile. Achievement grades were also divided into three groups. When the test scores and

grades were tabulated in a 3 by 3 table, information useful in counseling and teaching practices as well as in prediction of success in academic work was obtained. *L. Bouthilet.*

Lewinski, Robert J., Lt. Comdr., H–V (S), USNR. "Discriminative Value of the Sub-Tests of the Bellevue Verbal Scale in the Examination of Naval Recruits." *Journal of General Psychology,* XXXI (1944), 95–99.

The original form of the *Bellevue Verbal Scale* was administered to 451 naval recruits at the Great Lakes Naval Training Station who were referred for examination to determine their fitness for military duty. In terms of the mean weighted scores the performances of each of the four I.Q. categories on each of the five sub-tests (arranged in order from best to worst) were as follows: Normal Group (I.Q. 91–110; Mean I.Q. 100.22; N 51): Comprehension, Information, Arithmetic, Similarities, Digit Span; Dull Normal Group (I.Q. 80–90; Mean I.Q. 83.72; N 53): Comprehension, Digit Span, Arithmetic, Similarities, Information; Borderline Group (I.Q. 66–79; Mean I.Q. 71.73; N 189): Comprehension, Digit Span, Similarities, Information, Arithmetic; Mentally Deficient Group (I.Q. below 66; Mean I.Q. 59.16; N 158): Comprehension, Similarities, Information, Digit Span, Arithmetic. The standard deviations of the various groups for the total scale, and to a lesser degree for the sub-tests, were relative to the I.Q. ranges. All critical ratios were sufficiently large to indicate that the obtained differences are statistically significant. The data reported indicate that all the sub-tests are satisfactory in differentiating the four categories. *Marion H. Groves.*

Lord, Frederic M. "Reliability of Multiple-Choice Tests as a Function of Choices per Item." *Journal of Educational Psychology,* XXXV (1944), 175–180.

Changing the number of choices per item in a multiple-choice test changes the reliability of the test. In order to express the amount of change a formula based on the Spearman-Brown prophecy formula is derived. The reliability of the revised test, with a change in number of choices per item, is given in terms of the reliability of the original test, and a constant value is determined by the percentage of individuals answering the items correctly and by the number of choices per item in the original and revised tests. Although an empirical check demonstrated the usefulness of the formula, further experimentation is to be desired. *L. Bouthilet.*

Manson, Morse P. "The Concepts of the Profile, Psychograph, and Evalograph." *Journal of Educational Psychology,* XXXV (1944), 145–156.

Over a hundred different terms have been used to describe the graphic devices of the profile, the psychograph (both in use for at least 30 years), and the evalograph (developed here for the first time). Precise definitions are needed. Taking into consideration some of the literature on the subject the following definitions are offered: (a) A "profile" is a graphic curve or line constructed from many individual or group measurements and/or estimates expressed in identical terms. (b) A "psychograph" is a condensed analytical record of a complex of factors, containing a profile and related numerical and descriptive data. (c) An "evalograph" is a psychograph with additional interpretive and control data, requiring clinical techniques for most effective use. *Marion H. Groves.*

Older, H. J. "An Objective Test of Vocational Interests." *Journal of Applied Psychology,* XXVIII (1944), 99–108.

The author presents the method and results of a new technique in measuring vocational interests. Pictures representing various occupational activities were projected onto a screen, after seeing which the subjects—336 high-school students, 248 college students, and 59 business college students—were tested on the material they had viewed. Scores for those who took supplementary tests also revealed low correlation with intelligence scores and with the *Strong Vocational Interests Blank.* However, close relationship was found between expressed ambitions and test results. This vocational interest test is regarded as an objective measure of an individual's dynamic interests in contrast with the subjective quality of the Strong inventory. *Vernon S. Tracht.*

Poston, F. "An Evaluation of Word and Picture Tests for First and Second Grades." *Journal of Applied Psychology,* XXVIII (1944), 142–152.

Three widely used primary-grade word recognition tests were presented individually to 100 unselected first- and second-grade pupils equated for age, M.A., sex, school grade, and achievement in reading. Of four methods of presentation, the children obtained highest scores when asked to select a printed word after hearing it pronounced, and when identifying a word when shown a corresponding picture. Considerably more difficult were pronouncing a word without a picture and giving the "correct" name for pictures alone. Analysis of the items revealed that the words in the tests are not graded in difficulty and that a great amount of variability is present in responses to the same pictures. The presence of the pictures was sometimes a retarding factor because they suggested to the children words other than those intended by the authors of the tests. The same words appearing with different distracters became more difficult as the distracters approached the form or meaning of the test item itself. *Edith S. Jay.*

Rashevsky, N. "Contributions to the Mathematical Theory of Human Relations. VIII: Size Distribution of Cities." *Psychometrika,* IX (1944), 201–215.

An attempt is made to connect the distribution function of the sizes of the cities with the distribution functions of some other characteristics of the individuals in the society. Several theoretical possibilities are discussed and different relations are derived. A possible connection with some observed relations is discussed. (Courtesy *Psychometrika.*)

Rautman, A. L. "Performance of Mental Defectives on the Revised S–B and the Kent E–G–Y Tests." *Journal of Applied Psychology,* XXVIII (1944), 329–335.

Three hundred and fifty mentally retarded patients were given the *Kent Oral Emergency Test* and then the *Revised Stanford-Binet* in order to determine the relationship between the two. Scores showed the *Kent* to be approximately 10 I.Q. points higher, with a coefficient of correlation between the I.Q.'s of .84 ± .01. An analysis for internal consistency revealed several unsuitable questions. When allowance is made for the difference in I.Q. found in this study, the *Kent E–G–Y,* which contains twenty-five chosen questions and takes only ten minutes to administer, can be used to advantage in clinical situations where a short and simple, yet fairly accurate, preliminary test of mental ability is required before any corrective steps are undertaken. *Vernon S. Tracht.*

Rosenzweig, Saul; Bundas, Lourene E.; Lumry, Kelly; and Davidson, Helen. "An Elementary Syllabus of Psychological Tests." *Journal of Psychology,* XVIII (1944), 9–37.

An explanation is presented of the purpose, materials, instructions, data, scoring methods, and interpretation of five types of psychological tests with representative tests of each type. A. Tests of Intelligence: *Stanford-Binet, Cattell Infant Intelligence Scale, Wechsler-Bellevue Intelligence Scale, Otis Self-Administering Test of Mental Ability, A Point Scale of Performance Tests, Form I.* B. Tests of Intellectual Deterioration: *Babcock-Levy Revised Examination for the Measurement of Efficiency of Mental Functions, Goldstein-Scheerer Cube Test of Abstract and Concrete Behavior, Wells Memory Test.* C. Tests of Vocational Aptitude: *Minnesota Mechanical (Aptitude) Assembly Test, Seashore Measures of Musical Talents, Strong Vocational Interest Inventory.* D. Tests of Personality: *Bernreuter Personality Inventory, Allport-Vernon Study of Values, Word Association Test.* E. Projective Approaches to Psychodynamics: *Rorschach Test, Thematic Apperception Test, World Test, Rosenzweig P–F (Picture-Frustration) Test. Betty Steele.*

Russmore, J. T. "Comparison of an 'Industrial' Problem-Solving Task and an Assembly Task." *Journal of Applied Psychology,* XXVIII (1944), 129–131.

The *Crawford Test of Tridimensional Structural Visualization* was administered ten times in succession to 87 women and 44 men university students. Assuming that the first trial measured tridimensional structural visualization, while the tenth trial measured an "assembly function," the two groups were compared on each of these two abilities. The critical ratios for the ten trials varied from .03 to .27, indicating no

significant sex differences in mean levels of performance on any trial. The first and tenth trial for the women correlated .36 ±.12; for the men, .09 ±.15. The university students differed slightly from the original Crawford standardization group in initial performance, but the restriction in the range of talent is not sufficient to explain the low correlations obtained. It is concluded that no sex differences in mean levels of performance were found for either function. *Edith S. Jay.*

Sprache, George. "The Abbreviated Stanford-Binet Scale in a Superior Population." *Journal of Educational Psychology,* XXXV (1944), 314–318.

Wright's modified short scale of the *Stanford-Binet* was administered to one hundred pupils of a nursery-school and two private schools in New York City. I.Q.'s below average were not used. It was found that the modified scale was superior to the clinically used short scale in range, size, and frequency of errors for predicting long-scale results. The modified scale also had greater predictive value in a subnormal population than in a superior population. However, the relatively large prediction error makes the use of the full scale preferable. *Betty Steele.*

Sumner, F. C. and Brooker, N. M. "Prognostic and Other Values of Daily Tests." *Journal of Applied Psychology,* XXVIII (1944), 323–328.

The records of students who were given short, objective, daily tests in a course in General Psychology were analyzed. The correlation between the averages on the first 5 tests and on all 40 tests was .82. Although the mean score of all students increased, the poorer students showed a greater increment. It is concluded that the prognostic value of daily tests is more reliable as an indicator of success in the course than that of general intelligence test results. Moreover, the program is of value in the learning and motivational aspects of the situation. *L. Bouthilet.*

Thurstone, L. L. "Second-Order Factors." *Psychometrika,* IX (1944), 71–100.

Second-order factors are defined and illustrated in terms of a literal notation, a physical example, a diagrammatic representation, a geometrical example, and the matrix equations relating the first-order and second-order domains. Both kinds of factors are discussed as parameters which may be not only descriptive of the individual objects in a statistical population but also descriptive of the restrictive conditions under which the objects were generated or selected. Second-order factors may be of significance in reconciling the several theories of intelligence. This paper is concerned with test configurations that show simple structure. If such a structure is not revealed, then the second-order domain is indeterminate. (Courtesy *Psychometrika.*)

Tsao, F. "A Study of the Relationship between Grade and Age Variability." *Journal of Experimental Education,* III (1944), 187–200.

The *L. Test* and Bartlett's procedure were applied to data gathered by Thorndike, Whitmire, and Pressey. The results indicated that the difference in variability from age to age is not significant. The *L. Test* and Bartlett's procedure then were applied to two Canadian public schools, grades five and eight. Materials used were the *National Intelligence Test, Scale A, Form I, Schorling-Clark-Potter Arithmetic Test, Form A,* and the *Otis Reading Survey, Form I.* Results indicated that variability is constant from grade to grade and age to age. The relationships among mental and scholastic functions are positive but not perfect, and these relationships are constant from grade to grade. On the bases of these results, it is suggested that individual differences should be emphasized as early as possible by the placement of a child in a subject according to his ability. All children in the same class would then have approximately the same standing. *Betty Steele.*

Tucker, Ledyard R. "The Determination of Successive Principal Components without Computation of Tables of Residual Correlation Coefficients." *Psychometrika,* IX (1944), 149–153.

A procedure is presented for determining the successive principal components of a correlation matrix where it is not necessary to compute the successive tables of residual correlations. The original correlation matrix is bordered with a new row and column for each principal component that is determined. (Courtesy *Psychometrika.*)

NEWS NOTES*

The A.C.P.A. has sent to each of its members copies of "Personnel Work in the Post War College and University," by J. G. Darley, and the American Council on Education brochure "Counseling and Post War Educational Opportunities," edited under the chairmanship of E. G. Williamson, of the Committee on Student Personnel work of the A.C.E.

As an organization, the A.C.P.A. endorses the proposal for an International Office for Education, to aid in the creation of more healthful relations among peoples and, through them, among nations of the world.

Thelma Mills, Chairman of the Membership Committee is pleased to introduce the following new members:

William M. Adams, 2nd Lt. AUS, 500 Brook Avenue, Lafayette, Louisiana.
Ruth L. Alexander, 804½ E. Eighth Street, Bloomington, Indiana.
Thelma Albright, Dean of Students, Queens College, Charlotte, North Carolina.
Gordon V. Anderson, Acting Director, Student Counseling Bureau, University of Minnesota, Minneapolis, Minnesota.
Irwin A. Berg, Clinical Counselor and Associate in Psychology, University of Illinois, Urbana, Illinois.
Mrs. Dorothy Brooks, Dean of Women, Dennison University, Granville, Ohio.
Paul J. Brouwer, Cooperative Study in General Education, 5835 Kimbark Avenue, Chicago, Illinois.
John W. Bunn, Dean of Men, Stanford University, California.
Lt. John Butler, A.S.T.P., SCU 3700, University of Minnesota, Minneapolis, Minnesota.
Dean C. W. Cannon, Cooperative Study in General Education, 6010 Dorchester Avenue, Chicago, Illinois.
O. R. Chambers, Head, Department of Psychology, Oregon State College, Corvallis, Oregon.
Barbara M. Clark, Assistant Director, Student Activities Bureau, University of Minnesota, Minneapolis, Minnesota.
Harold W. Colvin, Y.M.C.A. National Council, 19 S. La Salle Street, Chicago, Illinois.
James H. Corson, Dean of Men, College of the Pacific, Stockton, California.
Margaret L. Cunninggim, Dean of Women, Ripon College, Ripon, Wisconsin.
Marguerite R. Dressler, Assistant Director of Personnel, Florida State College for Women, Tallahassee, Florida.
Charles V. Dunham, Director of Student Employment, University of Texas, Austin, Texas.
Wilma Eldersveld, Psychological Clinic, University of Michigan, Ann Arbor, Michigan.
Mary Catherine Evans, Vocational Adviser for Women, Indiana University, Bloomington, Indiana.
Marian Faries, Assistant Dean of Students, College of City of New York, New York, N. Y.
Mrs. Leona Wise Felsted, Chairman, Personnel Committee, Illinois Wesleyan University, Bloomington, Illinois.
Helen E. Focht, Assistant Director, Office of Student Affairs, State University of Iowa, Iowa City, Iowa.

* News items concerning members of the American College Personnel Association should be sent to Grace E. Manson, Northwestern University, Evanston, Illinois.

John D. Foley, Assistant to the Dean, Office of Dean of Students, University of Minnesota, Minneapolis, Minnesota.
Mary Lou Griswold, Placement Secretary, New York State College of Home Economics, Cornell University, Ithaca, New York.
Thomas J. Hand, Vocational Advisory Service, 87 Madison Avenue, New York, New York.
Dr. W. Ballentine Henley, President, College of Osteopathic Physicians, Los Angeles, California.
George Hilliard, Director of Personnel and Guidance, Western Michigan College of Education, Kalamazoo, Michigan.
George E. Hill, Director, Student Personnel Service, Macalester College, St. Paul, Minnesota.
Arthur C. Hicks, Acting Registrar, Western Washington College of Education, Bellingham, Washington.
M. Eunice Hilton, Dean of Women, Syracuse University, Syracuse, New York.
Leila L. Holcomb, Assistant Counselor, University Residences for Women, University of Texas, Austin, Texas.
Wilbur J. Humber, Dean of Student Affairs, Kalamazoo College, Kalamazoo, Michigan.
Katherine J. Jones, Executive Secretary, Nursery Training School of Boston, 355 Marlborough Street, Boston, Massachusetts.
Flemmie P. Kittrell, Dean of Women, Hampton Institute, Hampton, Virginia.
Mrs. Estella Hitchcock Lane, Dean of Students, Frances Shimer College, Mt. Carroll, Illinois.
Corrinne G. La Barre, Research Assistant, Western Personnel Service, Pasadena, California.
Patricia A. Lahr, Director, Student Union, University of Nebraska, Lincoln, Nebraska.
Howard C. Madsen, Manager Technical Employment and Training, Westinghouse Electric and Manufacturing Company, Pittsburgh, Pennsylvania.
Betty Anne Mallay, Director of Appointment Bureau, Manhattanville College of the Sacred Heart, New York, N. Y.
Thomas O. Marshall, Director of Student Personnel, Colorado State College, Fort Collins, Colorado.
Harry M. Mason, Testing and Guidance Program, University of Texas, Austin, Texas.
Catherine Northrup, Assistant Director, Student Personnel, Colorado State College, Fort Collins, Colorado.
Dorothy Olson, Director, Texas Union, University of Texas, Austin, Texas.
L. R. Palmerton, Director Student Personnel, South Dakota School of Mines, Rapid City, South Dakota.
Penelope M. Pearl, Psychological Clinic, University of Michigan, Ann Arbor, Michigan.
C. R. Penoi, Faculty Exchange, University of Oklahoma, Norman, Oklahoma.
Harold B. Pepinsky, Office of Dean of Students, University of Minnesota, Minneapolis, Minnesota.
Julia E. Read, Personnel Director, College of St. Elizabeth, Convent Station, New Jersey.
Thomas F. Richardson, Director Student Personnel, Texas Christian University, Fort Worth, Texas.
Howard L. Roy, 507 Oak Street S.E., Minneapolis, Minnesota.
Chester H. Ruedisili, Assistant Dean of College of Letters and Science, University of Wisconsin, Madison, Wisconsin.
John Dale Russell, Dean of Students, Division of Social Science, University of Chicago, Chicago, Illinois.
William H. Seaman, Director of Admissions and Bureau of Appointments, Oberlin College, Oberlin, Ohio.
Jane E. Stephanus, Acting Placement Director, University of Detroit, Detroit, Michigan.
Mrs. Jean T. Stromberg, Assistant to the Counselor, Cornell University, Ithaca, New York.

C. Woody Thompson, Director, Office of Student Affairs, University of Iowa, Iowa City, Iowa.
Alice L. Thorpe, Appointment Office, Wheaton College, Norton, Massachusetts.
M. R. Trabue, Dean, School of Education, Pennsylvania State College, State College, Pennsylvania.
Leona E. Tyler, Director, Bureau of Personnel Research, University of Oregon, Eugene, Oregon.
Mrs. Frances Gibson Wallace, Freshman Adviser, Hollins College, Hollins, Virginia.
Robert S. Waldrop, Clinical Assistant, Psychological Clinic, University of Michigan, Ann Arbor, Michigan.
Mrs. Dorothy S. Whitehead, Supervisor of Student Aid, University of Georgia, Athens, Georgia.
Jane Louise Winningham, University Elementary School, Ann Arbor, Michigan.
Austin B. Wood, Assistant Professor of Psychology, Brooklyn College, Brooklyn, New York.

Elizabeth G. Andrews, Director of Personnel, Florida State College for Women, has prepared a manual for the use of faculty counselors at her institution.

A. J. Brumbaugh has recently accepted the Vice-Presidency of the American Council on Education, Washington, D. C.

Harold B. Pepersky has been appointed Counselor, Vocational Counseling and Guidance Center, University of Kansas, Lawrence, Kansas.

Lieut. R. L. Swann, U.S.N.R., has been transferred from the U. S. Naval Flight Preparatory School at the University of South Carolina to the Naval Air Training Center, Corpus Christi, Texas.